NATURE MAGAZINE

OCTOBER 1928
VOL. 12, NO. 4

California Number

35 CENTS

Tulips & Springtime!

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Plant Schling's Bulbs *This Fall*

DARWINS and Cottage, single and double, early and late—their lovely cups brimming with color and nodding a merry "good morning" to you every day for weeks—from early April to June in fact—How can you afford to miss them!

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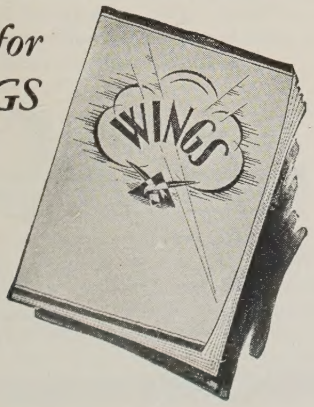

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The beauty of Guild books has continued to amaze members and non-members alike. No economy is exercised in the production of Guild selections. The best paper and binding materials are always used, specially chosen types and artistically designed covers and title pages are features of the Guild editions. BLACK MAJESTY, one of the most popular Guild books issued, was illustrated throughout with three-color, full page pictures and other decorations by Mahlon Blaine.

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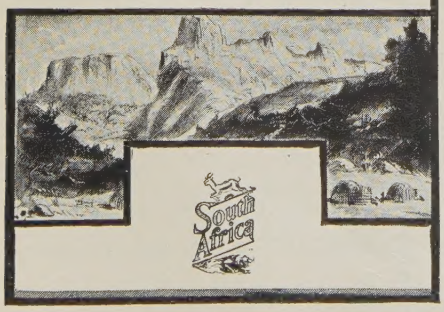

Readers of this column are urged to write to the Travel Editor for any information desired relative to travel, whether it is for short distances or long distances. To all inquirers will be sent, by return mail, some definite information and this will be followed by special literature regarding the places about which they desire information. This department is designed to be of direct personal service to the readers of this magazine.

Since this issue as a whole is devoted to California, the Travel Department will be devoted exclusively to presenting information about transportation to and in that state, and points of interest along the various routes.

Going by rail to California the tourist has several railroads from which to choose. A popular route is the Santa Fe from Chicago to San Francisco. This road features what is called the Indian Detour, a three day motor trip through the Spanish and Indian Southwest, visiting the ancient Indian pueblos and prehistoric cliff-dwellings of the New Mexico Rockies, and the great valley of the upper Rio Grande. In many of the pueblos groups of Indians eke out an existence in the same manner their forefathers did three centuries ago. The tour can be extended if the traveller desires to cover a larger section of this area. Hotel accommodations are provided, or camping equipment if preferred.

* * *

A trip with more than the usual amount of variety in scenery and climate can be arranged by travelling either to or from California over one of the more northerly routes. The Great Northern, Northern Pacific, Union Pacific, Chicago, Milwaukee & St. Paul, C. B. & Q. have main lines running from Chicago to Seattle and Portland. From these points the traveller has the choice of three methods of transportation southward. It is possible to go by boat down the coast to San Francisco, a pleasant and comfortable trip; or one may go by train. The third method, more modern and a great deal faster, is to take advantage of the air service that has been established connecting the four cities—Seattle, Portland, San Francisco, and Los Angeles. This has attained great popularity, particularly among those who must of necessity make the trip often. The planes are of the cabin type, running on schedule, and have done a great deal toward promoting travel to California over northern routes.

Where Nature Raged

—then smiled her loveliest!

MOUNTAINS pitted with huge craters and scarred with vast lava flows tell the story of Hawaii's fiery origin. But nowhere on earth has Nature compensated for her violence with more gentleness and beauty.

She has cooled those burning slopes with soft trade breezes — then covered them gorgeously with flowers, shrubs and trees. Along palm-fringed shores, she has planted coral gardens, as fairy-like playgrounds for her bewildering variety of ocean life. And over all, at night, she spreads the mystic ecstasy of her tropic moonlit nights.

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Write for Special Hawaii Tour Folder. For additional information and reservations, apply any authorized agent, or—

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The state of California is well covered by its various railroads. The Southern Pacific, connecting at Ogden with the Union Pacific, runs its main line down the center of the state, with branches to important cities on the side. The company has issued some very attractive literature covering their route, and points of interest and scenic beauty throughout the whole of California.

* * *

The Southern Pacific offers four distinct routes to California, one from New Orleans, two from Chicago, and one from Seattle. These meet at San Francisco, and also at Los Angeles. Several fast trains make the trip from Chicago to California in about 63 hours.

* * *

Among the popular routes to the Pacific Coast is that of the Denver & Rio Grande Railway on which a great deal of very attractive scenery is an inducement to travellers to take that route. A more northern route is that by way of the Chicago, Milwaukee and St. Paul, a railway which for a considerable distance is electrified, or, as the railroad holders attractively describe it, "running trains with running water," while still further north is the Canadian Pacific running through the wonderful Canadian Rockies, and landing its passengers at Vancouver from where they may go by boat or by train to California.

* * *

Beyond its own attractions, California is also the gateway to other scenic beauties and tourist objectives in Hawaii and the Orient. Los Angeles and San Francisco are the ports respectively of the Los Angeles Steamship Company and the Matson Line with fine fleets of ships and a full schedule of sailings to the west. Any readers of this department who are planning to extend their travels farther west than the Golden State are urged to write for descriptive matter about these two lines and their service.

* * *

Surprisingly few people outside of California realize that the state contains a lake which, for beauty and grandeur, rivals even Lake Louise. Lake Tahoe, near the crest of the Sierra Nevada, on the boundary between California and Nevada, is about 20 miles long, and from 8 to 12 miles wide. The great mountains surrounding it, the unexcelled blue of the water set in a green frame of forested shores, and the charming hotels and cottages, have made it one of the most popular resorts. During the snow season winter sports reign, and a Carnival is staged. The Southern Pacific has run a line from Truckee, a picturesque lumber town on the Truckee River, direct to the shore of the lake, and a ticket on that road entitles one to a stop-over of ten days.

* * *

Because of the great number of tourists visiting California each year the state is thoroughly equipped with hotels. Bungalows can be rented in practically all cities and resorts. Among the hotels we mention one unique of its kind—the Mission Inn. This

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see the scenic

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Mountain Lovers

Friends of the Western Mountains is an informal organization which was founded in September, 1926. The originator and secretary is C. Edward Graves of Arcata, Cal. The object of the organization is to stimulate greater interest in and appreciation of the natural and scenic beauties of the western mountains of the U. S., Canada and Alaska. Members receive a yearly series of Picture-Letters, each series dealing with some particular portion of the western mountains. These letters are mailed weekly and each one includes an original photograph of some interesting feature of the mountain country together with a 500-word description of the scene or of experiences in that section of the mountains. The following series have so far been issued: Yosemite, 10 letters; Crater Lake, 10 letters; Mt. Hood, 20 letters; Trinity Mts. (Northwestern California), 10 letters. The new series begin in the fall of each year, and the series for 1928-9 will cover the Mt. Baker region in northern Washington, probably a 20-letter series. The subscription price, which also constitutes membership in the organization, is 10c per letter and is intended to cover only the cost of issuing them.

Another activity of the organization is the gradual collection of a library of literature pertaining to the western mountains. The only extensive collection of the kind at present in existence is that of the American Alpine Club which is housed in the New York Public Library. Another such library is needed on an even larger scale in proximity to the mountains themselves. An information bureau and lecture bureau are other activities of the organization that will gradually be developed.

"We came into a delightful, sunshiny room"

Janet, I've spent this whole day exploring! From the time they showed us our delightful room, I've been over every nook and cranny! How lovely it is here! Just like some gracious home—with the most charming people. Every one is pleasant and cheerful; you can tell they must come here year after year. . . . On the way to the dining-room (the food is delicious!) we discovered the Garden Room. Perfectly beautiful flowers, and a view right out on the ocean. We're going to have tea there this afternoon. . . . At least, I *think* we are! Bob's taken a book up on the Ocean Deck, and if he once gets settled in a steamer chair, I'll *never* get him away.

Many things interesting about Chalfonte-Haddon Hall are contained in a booklet we have. May we send you a copy?

CHALFONTE-HADDON HALL

Atlantic City
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California motor roads are widely known for their excellence of construction, smoothness, and the marking system that enables the stranger to find his way about the state without difficulty. Perhaps the most famous road is El Camino Real (the King's Highway), which marks the route trodden by the Spanish padres when they founded that great chain of missions between San Diego and San Francisco. Twenty-two of these missions still stand along the road, and help in giving some of the color of the old romantic California to the new.

* * *

The road over the miles of mountains of the Ridge Route between Los Angeles and the San Joaquin Valley presents beautiful vistas to the tourist. The Redwood Highway runs north of San Francisco along the coast, taking in practically all of that wonderful belt of redwoods that extends from San Francisco right to the Oregon boundary. Except in the higher mountains the entire state is open to motor travel throughout the year.

* * *

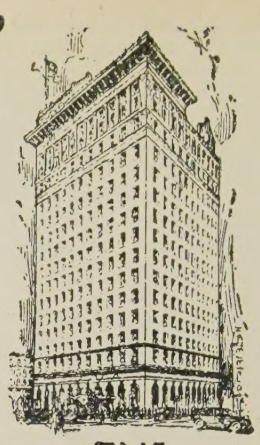
The Monterey peninsula with its clustering of gay resorts has always been popular. Monterey was the capital of the old Spanish California, and a number of the picturesque buildings of that time still remain. The mention of Monterey conjures up a picture of the storm twisted cypress groves, found only on this peninsula. There are excellent hotel accommodations.

* * *

The three best known California National Parks are in the same section of the state—the west central. Yosemite covers more than 1,100 square miles, but its most spectacular sights are grouped around the Merced River in Yosemite Valley. It is open all year, and reached either by train or motor. Giant Forest, in the heart of Sequoia National Park, is the most magnificent of the remaining groves of Big Trees. It is easy of access at all times, few roads being more unique and interesting than the Park Road (the Generals' Highway), which follows the canyon of the Kaweah River for 5½ miles, and then winds up on the ridge to the Big Trees. Also it is worth a special trip to the tiny General Grant National Park, near Sequoia, if only to see the great General Grant Tree, 33 feet in diameter, and 280 feet high.

* * *

The 18 national forests of California, which were visited last year by more than seven million people, rank as the leading recreation areas of the country, the U. S. Forest Service reports. Travel to the California forests has increased over seven hundred per cent in the last ten years. Over eighteen and one half million people visited the 160 national forests of the United States during 1927. Other western states trailing



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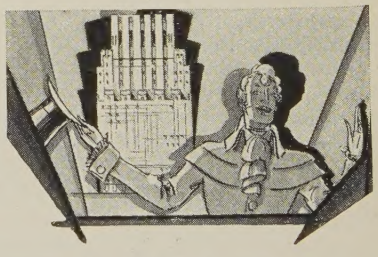

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California for its lead were Oregon, Colorado, Arizona, and Washington.

* * *

The need for better trails to satisfy the comfort-demanding tourist is to be met in Sequoia National Park by the construction of a "High Sierra" trail connecting Giant Forest with John Muir Trail to Yosemite and Mt. Whitney, the National Park Service recently announced. This trail, which will not be an auto road, but made for the rider and hiker, will follow one of the most magnificently wild scenic routes of North America, and will open up "back country" to the average camper and horse-back enthusiast.

* * *

More than two hundred and fifty thousand big game animals dwell in the 18 national forests of California, the 1927 wild life census made by the U. S. Forest Rangers reveal. There are 121,000 black tail deer, 117,000 mule deer, 10,000 black and brown bear, 680 mountain sheep, and 125 elk. While man killed more than 11,000 deer during the open season, predatory animals killed twice that number, and action is desired for further reduction of the number of predatory creatures. While quail are increasing, the numbers of grouse, ducks, and geese are dwindling in these regions.

An Indian Eden

California has been designated as an Indian Eden by J. F. Harrington of the Smithsonian Institution's Bureau of American Ethnology, who has recently returned from making an investigation of the Mission Indians of the state. With corn and the live oak growing in abundance, the Indian life of the past was a round of ease, adventure and sport, he has found, and Southern California supported a larger population than any other similar area in North America. Mr. Harrington excavated an old Indian rancheria site on his trip, and found there some unsprouted, unrooted calandrinia seeds.

The Last Link

A wrinkled, toothless old squaw, named Maria Lebrado, recently gave an interview to C. P. Russell, Yosemite's park naturalist, and told him of the days of Tenaya and the discovery of Yosemite by white men. She is the last link connecting the present with the aboriginal past, the only remnant of the Indian band who tried to oppose J. D. Savage and his band when they invaded Yosemite, the first white men, in 1851. She now lives on a Mariposa hillside, still filled with bitter recollections of the treatment accorded her race by the harbingers of "civilization".

Brush Fires

California foothills are being eroded and denuded of trees, and future fires will succeed in entirely replacing oak groves and yellow pine forests with grass and brush, unless brush fires are stamped out, and fire protection increased, the National Park Service warns after a study of conditions. It advises letting the brush grow, to be finally replaced naturally by more valuable species of timber.

"Most marvelous of sights to man"

The Grand Canyon

This matchless view of the grandest of earth's gorges was sketched from the splendid new Union Pacific Grand Canyon Lodge, on the brink of the lofty North Rim, Grand Canyon National Park.

See this mighty chasm 220 miles in winding length, a mile deep, and 13 miles wide, through which the rampaging Colorado River has ploughed the inner granite gorge, flanked by gigantic towers and temples gloriously colored from the palettes of the gods.

This awe-inspiring abyss is but one attraction on the Union Pacific Utah-Arizona tour, which includes also

Zion National Park
Cedar Breaks
Bryce Canyon
Kaibab National Forest

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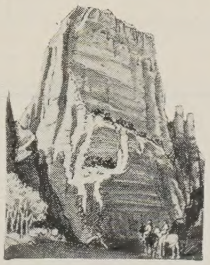
The Great White Throne in Zion National Park



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October

Who's Who in This Issue

California was selected as the first of our special numbers, since, as winter approaches, many turn their thoughts to the Golden State. The editors have been at work for six months on this issue, gathering pictorial material and articles, and welding this number together. There was much that could not be covered or that has been thoroughly covered in previous issues. Californians were sought to write most of the articles in this issue and we will take advantage of this space to introduce them to you.

Charles Fitzhugh Talman, however, is not a Californian, but his wide knowledge of weather includes acquaintance with *The Land of Many Climes*. Mr. Talman is with the United States Weather Bureau and is widely known as a writer.

Charles Francis Saunders needs no introduction to California Nature lovers. He is the author of books on the state's wild flowers and trees, a fine writer and botanist combined. He lives in Pasadena.

David Starr Jordan, president-emeritus of Leland Stanford University, has contributed a thought-provoking article to the California Number, and it would have been impossible to go to press without something from this great naturalist-educator.

As much of his time as he can spare, our president, Arthur Newton Pack, likes to spend in California. His story in this issue is a result of his experiences during his last visit to the coast. He is a Californian in affection, at least.

One of those most active in California Garden Club activities is Mrs. Elizabeth K. de Forest of Santa Barbara. She is also widely-known as a writer for garden publications, east and west. We feel that in *The Two-Season Year* she has presented the essence of California gardening joys.

Harold C. Bryant was of course asked to write the article on the *Parks of the Golden State*. Justice had to be done the glorious redwoods and this task was given to A. Brazier Howell, secretary of the American Society of Mammalogists. Mr. Howell has lived much in California although he is now in the East. Dr. Clinton G. Abbott, director of the San Diego Museum, was asked to summarize the museum work in the state. Mel Wharton of Hollywood has given the motion picture industry viewpoint.

Nature study is as far advanced in California as elsewhere and one of those active in the field of Nature Education is Roland Case Ross of the Nature Study Department of the Los Angeles schools. Mr. Ross has taken us on an attractive Nature ramble *Atop the Sierran Barrier*.

Mrs. Isabel M. Lewis is our regular astronomical editor but has done full justice to *California's Great Observatories*. She lives in the Nation's Capital and is on the staff of the U. S. Naval Observatory.

Forestry Education in California has been greatly furthered by the able work of Wallace Hutchinson, public relations chief of the San Francisco office of the U. S. Forest Service. None was better qualified to write of *The Land of the Ancient Forests*.

A mammalogist of wide attainments, Edward A. Preble, our own Consulting Naturalist, was asked to write of the mammals of California, of today and yesterday. He has done so in an article which we feel is a distinguished contribution to this issue.

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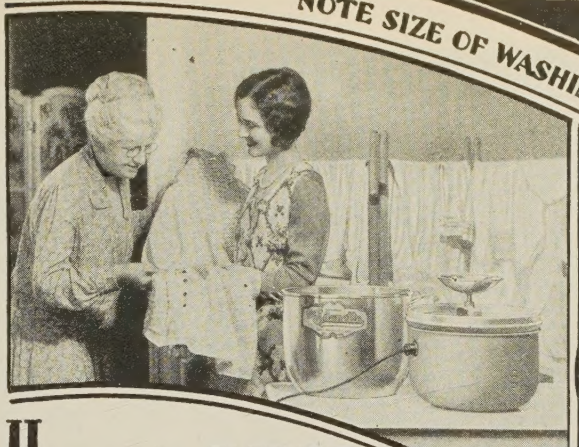

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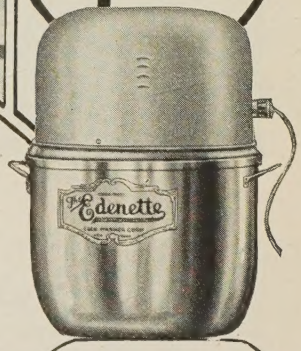

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A CALIFORNIA PASTORAL, MOUNT TAMALPAIS IN THE BACKGROUND

NATURE MAGAZINE

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THE AMERICAN NATURE ASSOCIATION

To Stimulate Public Interest in Every Phase of Nature and the Out-of-Doors, and Devoted to the Practical Conservation of the Great Natural Resources of America

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ROSY FINCH—*Leucosticte australis*

CALIFORNIA THRASHER—*Toxostoma redivivum*

ROAD-RUNNER—*Geococcyx californianus*

CASSIN'S KINGBIRD—*Tyrannus vociferans*

CALIFORNIA TOWHEE—*Pipilo crissalis*

WREN-TIT—*Chamaea fasciata*

A California Bird Sextet

by Carra E. Horsfall

Color plates by R. Bruce Horsfall

The California towhee frequents gardens and farmyards where he feeds upon insects and scratches in the straw for scattered seeds. He spends much time on the ground and his occasional short flights are a bit awkward because of his short wings and long tail. During the nesting season he betakes himself to some brushy area where the four or five brown-spotted pale blue eggs are incubated in a nest made of weed stems and bark fibers, lined with wool, soft grasses and horsehair, which may be placed on the ground or in a bush or tree as high as six feet. He is quiet and shy but one may hear his silvery tinkling song at intervals. This towhee is found in most of California west of the Sierra.

Among the highest peaks of the Cascades and Sierra Nevada dwells the leucosticte or rosy finch, bird of snows and granite ledges. His food,—beetles, ants, butterflies, bees, other insects and seeds,—is culled from the drifts. Some time in June, in a small rocky crevice, the nest of weed stems and coarse grasses, lined with finer grass and feathers, shelters four or five pure white fragile eggs. Rosy finches are most happy and carefree, scurrying before a snow blast to find shelter beneath the overhanging edge of an ice sheet or rock until the storm is over, when they are out basking in the sunshine again or hunting for food as merrily as ever.

Cassin's kingbird, though a bird of the mountains, is also found nesting in the valleys and may be quite common in some neighborhoods. The breeding season is from May through July. The nest, of characteristic kingbird architecture, is placed at the end of a branch well up in a sycamore, cottonwood or similar tree. It is made of plant fiber, weeds and rootlets, and lined with wool, thistledown, hair and feathers. Pieces of string, paper, and perhaps a snake skin usually are present as decorations. There are three to five brown-blotched, pinkish eggs. The female spends fourteen days in incubation, while the male guards the nesting territory by driving off hawks and crows. The kingbird is one of the most useful birds in its range for it destroys many harmful insects. These are caught on the wing as the bird launches into the air from a perch upon a branch tip.

An unusually thrilling moment is that which marks the first sight of a roadrunner in full action. His swiftness of foot is well known in the cactus-covered desert and the chaparral of the foothill country, which he prefers to the higher altitudes sometimes visited during the summer. He is an unsocial creature and will not admit another of his kind to his chosen feeding range, yet at times he will visit the farmyard and feed with the chickens. His appetite is voracious; lizards, large beetles, centipedes, grasshoppers, mice and snakes are a few of the items of his diet. He, or she, builds a compact nest in cactus, low thorny tree or bush, of sticks with a variety of materials for lining—inner bark, grass, mesquite pods, roots and feathers. There are four to six yellowish eggs. Unfortunately this curious bird is becoming scarce due to the extension of farming into its desert habitat.

W. L. FINLEY

CLARK'S CROW OR NUTCRACKER

The one family of perching birds peculiar to North America is represented by the wren-tit. His name suggests the fact that he combines the characteristics of wrens and tits. This relationship is evident if one is fortunate enough to see him on some densely brush-covered hill along the coast which is frequented by this small, soft-plumaged, elusive bird. His long tail is in constant wren-like motion as he chatters and hunts busily for insects in the chaparral, as he scolds some intruder, or skillfully handles the descending musical scale. His nest is built of grasses, roots and bark fibers, lined with hair of cattle or horses, and placed in a low bush. There are three to five bluish-green eggs.

The mockingbird has a gifted rival in the California thrasher who also delights in a perch upon the highest possible branch of bush or tree as he cleverly mimics the loveliest songsters in his vicinity. His rendition of the wren-tit's whistled scale often calls forth a reply from that bird himself. This thrasher is found in the shrubby bottom land as well as upon the mountainsides of the coast region in California south to Lower California. His long curved bill is used to excellent advantage as he flips aside twigs and leaves to dig in the uncovered earth and search for worms, insect larvæ, beetles and whatever food may be found upon the ground. The nest is a platform of roots, twigs and grasses, placed on a bush not far from the ground. Both birds share in its construction and in the incubation of the three or four brown-spotted, pale greenish-blue eggs. There are two broods each season, the male bird caring for the first family while the female is sitting the second time. These extra duties do not interfere with the rollicking, good-natured song.

NATURE CALENDAR

October

by E. Laurence Palmer

COLERIDGE, the author of "The Rime of the Ancient Mariner", was born in October. This work of his may serve this October as profitable reading in detecting the difference between fact and fancy. Though the author does not say so in definite words he draws pictures of conditions in both northern and southern hemispheres. The Nature descriptions vary from those accompanying sailing through icebergs, such as few will experience, to observations on marine phosphorescence, which many may have the opportunity of seeing in the fall. The phosphorescence seen in breakers or in the wake of ships is due to tiny marine protozoans that give off a blue-green light as they are disturbed. If one walks on wet sand containing these organisms, sparkling lights may appear within a radius of some feet.

October is a month of colors. The leaves of trees make most profound changes. The stagnant pools, sometimes a deep blue-green at the beginning of the month, become brown by the end of it. These changes are not, however, as remarkable as the visions of the ancient mariner who suffered for the shooting of a harmless bird. It is interesting that the incident Coleridge chose as being reponsible for all his hero's suffering was that of killing a bird. The wholesale slaughter of useful game birds in the month of October might be significant in this connection.

October is a month in which we may enjoy moonlight corn-roasts, coon hunts and Hallowe'en parties. We may rave about how much we like it but can hardly equal the description given by Leigh Hunt in Abou Ben Adhem when he said the "moonlight in his room" made it "rich and like a lily in bloom". It is immaterial whether "it" refers to the room or the angel since moonlight would enrich anything. Of course moonlight affects our moods. It adds mystery to an overnight hike, beauty to an evening's cruise on a lake and delight to an outdoor frolic. It is welcome where we wish to detect things and unwelcome where we wish to avoid being detected. Its source, the moon, is subject to some interesting observations, many of them being concerned with its apparent size. In this connection measure the apparent diameter of the moon with a rule held a foot and a half from the eye at various times such as when the moon is at the horizon and when it is well over head. Is the apparent diameter of a full moon greater than the greatest diameter of a half moon when they are viewed at approximately the same place in the sky?

James Boswell, who made himself famous by writing about the life of Dr. Samuel Johnson, was born in October. At one place in this book he reports himself as "several times" having "seen the experiment of placing a scorpion within a circle of burning coals". He says that "it ran around in extreme pain, and finding no way to escape, returned to the center, darted its sting into its head and thus at once freed itself from its woes". He further claimed that this "showed deliberate suicide in a reptile". It is interesting to note that Johnson refused to accept the fact unless the great anatomist Morgagni should certify that the sting could be found in the head after dissection. Of course the scorpion about which this was written is not a reptile and does not do as Boswell claims. Though this was only about one hundred and fifty years ago, Johnson had some interesting beliefs about bird migration. He said, "that woodcocks fly over northern countries is proved, because they have been observed at sea. Swallows certainly sleep all winter. A number of them conglobulate together, by flying round and round, and then all in a heap throw themselves under water, and lie in the bed of a river".

October is a month when other birds than these will be migrating to the south, some of them, like the arctic tern, taking journeys as long as the one taken by the "Ancient Mariner". We know more about the migrations of woodcocks than that they have been observed at sea. We even know of the remarkably long sea journey taken in the fall by the golden plover from our New England coast to South America.

We have learned that it is profitable to make accurate observations on other arthropods than scorpions not from a philosophical viewpoint but from the standpoint of economic entomology. We know that late fall plowing will bring certain hibernating insects to the surface where they may be destroyed by the frost which they might otherwise escape. We know that in case of serious insect infestation we can burn over certain fields even if in so doing we sacrifice some valuable organic matter. A hundred and fifty years from now we may make as great strides in understanding the ways of insects as we have since Boswell's time.

YOSEMITE FALLS, YOSEMITE NATIONAL PARK

NATURE MAGAZINE

Volume Twelve
No. Four

October, 1928

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TWO ASPECTS OF CALIFORNIA'S "CLIMATE" FROM TROPIC TO FRIGID

PALMS AT PALM SPRINGS AND, BELOW, SNOWDRIFTS IN THE SIERRA

THE LAND of MANY CLIMES

Not to Mention Several Varieties of Weather

by Charles Fitzhugh Talman

THE climate of California is famous—but it doesn't exist. There is no such thing. California does not have a climate, but she has climates, the most remarkable collection of them to be found within an equal area anywhere on the globe. Therefore when you visit the Golden State and the natives ask you the inevitable question, "How do you like our climate"? it will be entirely in order for you to rise to the occasion and retort, "Which one"? Of comfortable, health-giving, fascinating climates the state has more than her share. The advertising folders do not always describe them accurately, but the praise lavished upon them is, on the whole, deserved. As to her practically useful climates, the magnificent agricultural and horticultural products tell their own story. Even the climates that have con-

GOLF AT THE GOLDEN GATE

Enough moisture and sun to make the greens keen and the fairways soft on this San Francisco municipal course

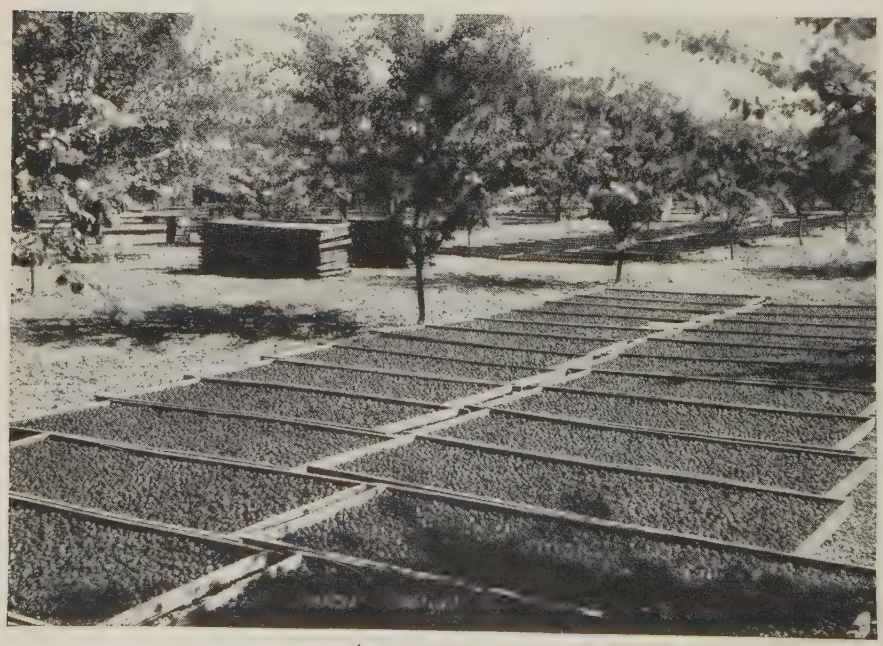
spicuous drawbacks have also their redeeming features. Thus the intense heat of the southern deserts and the central valleys is tempered by an exceedingly low humidity, which mitigates its discomforts, and sunstroke is said to be unknown.

A disproportionate amount of attention has, however, been devoted in the printed page to the charms and advantages of climatic conditions in California, and too little has been said about things that are interesting entirely apart from their relations to human comfort and welfare. California is a boon to the teacher of climatology. Nowhere else can be found better examples of the intemperate character of the so-called temperate zone, or of the fact that latitude has but little to do with the distribution of climates over the earth.

Is the world's hottest weather to be found somewhere near the Equator? The wisest geographers once thought so, but we now know that the heat of southern California deserts in summer surpasses that of any part of the torrid zone. In one of these deserts, Death Valley, there is an artificial oasis, produced by irrigation. It is called Furnace Creek Ranch. Formerly it was called Greenland Ranch, and the little Government weather station established here some years ago is still known under the old name. There is a startling incongruity in the fact that a place bearing this frosty appellation should have held for several years the world's record for hotness, until you discover that the name has reference to the verdant alfalfa fields growing here and not to the climate.

On July 10, 1913, the official thermometer at Greenland Ranch registered a shade temperature of 134 degrees Fahrenheit. This was unprecedented at the time, but has since been exceeded to the extent of two degrees by an Italian weather station in North Africa (well outside the tropics). It is pretty certain, however, that Greenland Ranch is not in the hottest part of Death Valley, and that if temperature measurements could be made elsewhere in the Valley the blue ribbon for torridity would come back to the United States. From June to September, inclusive, the mercury goes above 100 almost every day at this station. The aridity is as remarkable as the heat. The average yearly rainfall, 1.65 inches, is the lightest recorded anywhere in this country, and the air is so dry that is is impossible to drink enough water to slake one's thirst.

While one part of California beats the torrid zone for heat, another comes very near to holding the North American record for heavy snowfall. The snow of the high Sierra, in the northeastern portion of the state, is one of the meteorological wonders of the world. It is probably not equalled anywhere else on this continent, except perhaps on some of the lofty slopes of the Cascades in the state of Washington. California's mountain snowfields are worth more than all the gold buried beneath her soil, because their gradual melting during the long, dry summers



PUTTING THE SUN TO WORK

California's sun possesses qualities peculiarly fitted for this work

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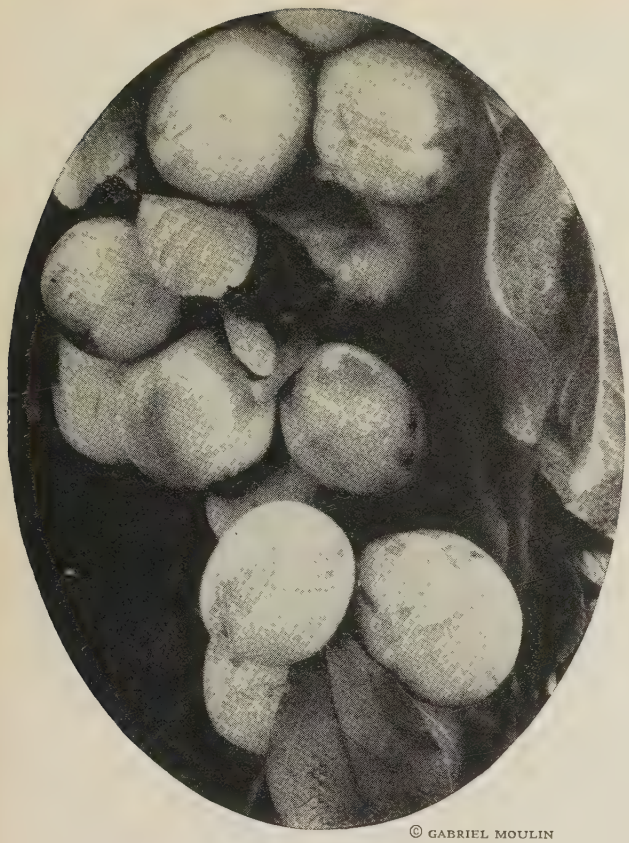

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A CLUSTER OF PRUNES

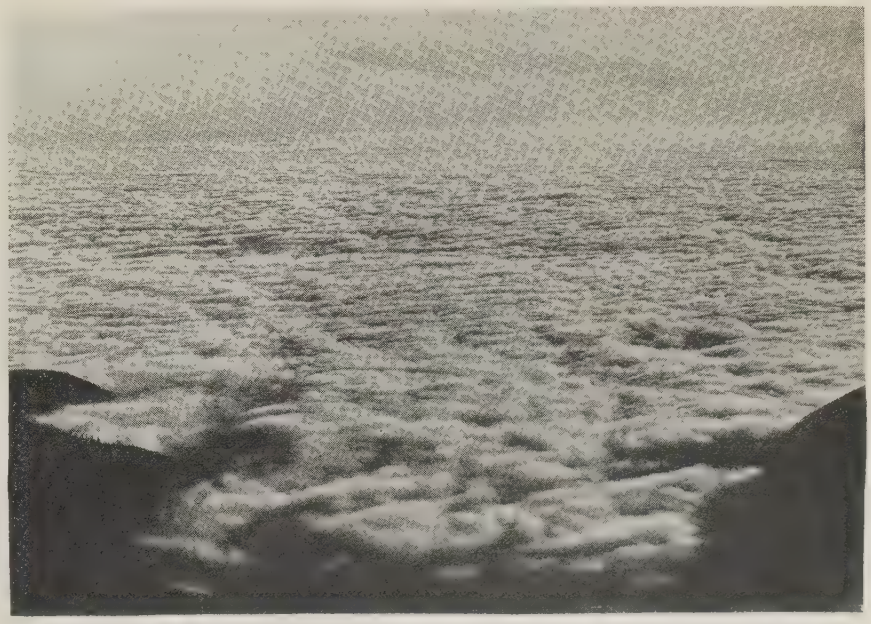
Fruit-growing is a leading industry in California, where the climate cooperates in making it a success

supplies a fairly constant supply of water for irrigation, power-production and municipal uses. The heaviest snowfall thus far measured in these mountains occurs at Tamarack, Alpine County, about eight thousand feet above sea level. The average here is thirty-eight feet of snow a year, and as much as seventy-four feet has fallen in a single winter. Travel fifty miles southwest of Tamarack and you come to a district where, at an altitude of seven hundred feet, barely an inch of snow falls each year. California abounds in these climatic contrasts.

Topography readily explains the varied climates of this state. The Pacific Ocean is adjacent to the west, and at all seasons there is a great preponderance of westerly winds along the coast. A marine climate, mild, moist and equable, prevails along the coast itself, but elsewhere the huge mountain ranges and the great valleys they enclose breed climates of their own. The inland temperatures run to extremes. Excessive heat prevails in summer not only in the southern deserts, but also in the central valleys, where the thermometer occasionally registers from 110 to 120 degrees, while in the northern Sierra the temperature in winter sometimes drops to 30 degrees below zero and has reached 36 below.

The rainfall is peculiar. The winds from the ocean are, of course, heavily charged with moisture, and in winter, when the land they encounter is relatively cool, some of this moisture is shed as rain and snow. The winter half-year is called the "rainy season", to distinguish it from the nearly rainless "dry season" of summer, but not as implying any resemblance to the season of daily downpours found in some tropical lands. In summer the onshore winds yield part of their moisture in the shape of fog before reaching the land, owing to the presence along the coast of a stretch of water much colder than the ocean farther west. This fog, which extends on an average about fifty miles out to sea, drifts inland a few miles in the afternoons, giving to a narrow coastal belt the anomaly of a summer climate damp enough to support a luxuriant vegetation though almost entirely without rain. Farther inland the air from the ocean mingles with the great mass of hot, dry air overlying the intensely heated land. The resulting mixture is not propitious for rain, which rarely falls anywhere in the state in summer, except in the form of occasional thundershowers. One of these may produce torrential rainfall over a small area. California, especially in the mountains, has had some spectacular cloudbursts. Thus at Campo, in San Diego County, 11.50 inches of rain fell in one hour and twenty minutes on August 12, 1891. This means 1,300 tons of water to the acre. At Opid's Camp, on the west front of the San Gabriel Range, on April 5, 1926, a downpour of 1.02 inches (115 tons to the acre) occurred in *one minute*. This was the fastest shower ever recorded in the world.

In California you may take your choice of climates. Along the world-renowned southern coast, the Mecca



F. ELLERMAN

THIS MAKES THE BEANS GROW

The foggy climate proves ideal for this particular farm crop

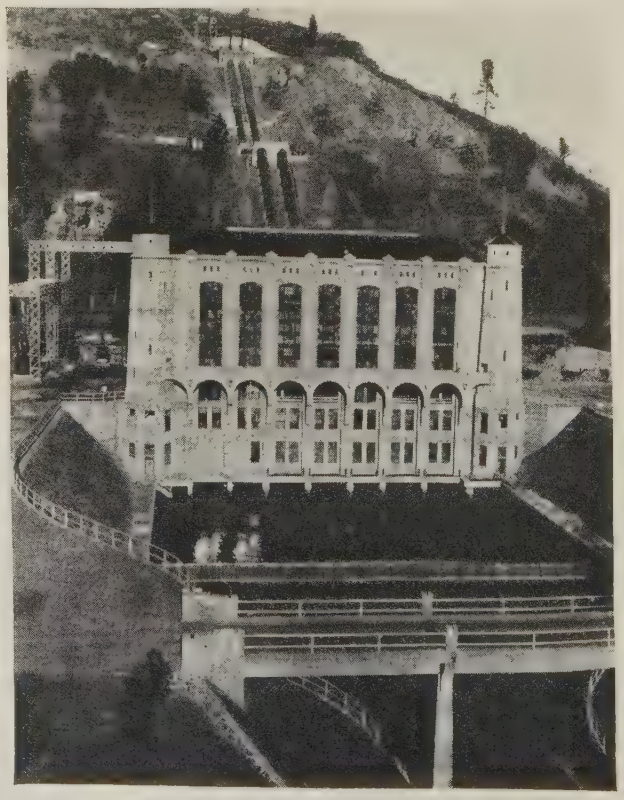
© FRASHERS, INC.

PROTECTING THE GRAZING SHEEP

Here Mt. Tom in the High Sierra towers above fields rich for sheep raising

WHERE SNOW COMES TO MARKET

One of the huge hydro-electric plants deriving water from the snow-fields



of tourists and home-seekers, you may bathe in mid-winter in a semi-tropical ocean and then, by traveling forty miles inland (and upland), enjoy the sports of sleighing, skiing and ice skating. An even more remarkable opportunity is offered you at San Francisco in summer. While sea breezes and the daily invasion of fog keep the lower air, as a rule, abnormally cool for the season, there is a fairly regular increase of temperature with increase of altitude. Thus by climbing the surrounding hills and mountains you may find as genial a climate as you please, the air at a height of two thousand feet being, on an average, about 30 degrees warmer than at sea level.

To make amends for her diversity of climates, California has little variety of weather from day to day, compared with what one finds in most parts of the United States. This is because the state lies off the beaten tracks of the storms that move across the continent from west to east in constant procession and diversify the weather of the country at large. In winter the northwestern storm tracks swing south of their average position and California feels the effects of these traveling disturbances to some extent, but in summer the atmospheric conditions of the state are controlled mainly by the slowly varying influences of certain quasi-stationary cyclones and anticyclones formed over land and sea.

When, however, the natives say, "We do not have weather in California, we have climate", they are expressing a broad generalization to which there are a good many exceptions. There is enough weather in San Francisco to keep people guessing about the choice of a comfortable costume, and it is not uncommon to see white duck and sealskin worn in combination there on a mid-summer day. The "Sonora" storms of the southern counties certainly belong to the weather category, as do the furious gales that occasionally sweep the northwest coast.

A particularly interesting variety of California weather is the hot, dry "norther" of the central valleys, occurring especially in the early summer. This parching, dust-laden wind makes life miserable for man and beast, be-

(Continued on page 263)

A FIELD OF CALIFORNIA POPPIES

THE STATE FLOWER OF CALIFORNIA

© GABRIEL MOULIN

CALIFORNIA'S WILD FLOWERS

They Are a Constant Delight to the Flower Lover

by Charles Francis Saunders

THE plant lover from the East, visiting California for the first time, finds in the native flora the charm of almost complete novelty. Here, as in Mexico, there is "climate on end". Within the limits of a summer day the traveler may pass by easy gradations from subtropical mildness at sea level to the chill of snow on boreal peaks two miles in the air. Moreover, the kinds of soil encountered will be as many as the spots on a pinto horse. As a consequence, the flora of the state is delightfully varied, and the flower enthusiast, whether a student or just an every-day lover of natural beauty, constantly finds himself in clover.

Leaving out of consideration for the moment the montane regions, where above two or three thousand feet winter brings killing frosts and snow, wild flowers may be found in bloom during every

DAINTY ROSE MALLOW

Only one of the many California wild flowers found in masses

VISUAL EDUCATION SERVICE

WHITE EVENING PRIMROSE

For a time it is to the desert one looks for beauty of bloom

F. M. FULTZ

VISUAL EDUCATION SERVICE

FIELD OF SHOOTING STARS

Long-stemmed flowers, like Independence Day fireworks

month of the year, though not in equal profusion. In autumn the floral tide is lowest—a time of rest. Then the earth is parched from long months of rainlessness, gasping for the return of the moisture-laden clouds. These may appear in September; often they are delayed until much later; but whenever the first liberal rain of the later year descends, that is the beginning of California's actual spring, whatever the calendar may say. Soon the tender green of wild grasses films the foothills and the untilled valley lands; in sunny pockets of the southward-facing slopes and in warm canyons, in sandy arroyos and on seaside downs, myriad winter annuals sprout and spread. In the leafless tangle of the hillside brush the pink wild currant bursts its buds, and there is the gleam of the fuchsia-flowered gooseberry's fiery blossoms. Any day you may come upon your first golden poppy in the fields, and glowing in the chaparral will be the dark crimson globes of the wild peony. Nemophilas and shooting stars have been gathered at Christmas and the dentaria's rosy blossoms at New Year's. By late February or early March throughout the coastal and valley regions, at least in the southern half of the State, a veritable floral pageant is under way.

Paradoxical as it sounds, it is to the deserts that the seeker of early wild flowers resorts with best hope

of reward. For a month or six weeks each year these arid wastes become in places flowery beyond belief. The time of blooming depends primarily upon the rains. If these

come early in the autumn, as sometimes happens, and in sufficiency (four or five inches will do) the sands of what is called the Colorado or lower desert will be brilliant with floral color by New Year's. Ordinarily, however, it is not until the last of February that the spectacle begins; then and during March you may drive for miles through unbroken expanses of yellow encelias and other composites,—pink sand verbenas, *Abronia villosa,* and white evening primroses. There will be cacti, of course—one naturally expects that of the desert—little mamillarias only a few inches high, scarlet or purple-flowered cerei, and tall columnar biznagas crowned each with a circlet of golden bloom. There are bushy daleas of half a dozen kinds conspicuously adorned with pea-like blossoms of ultramarine blue; mallows, salvias, oenotheras, gilias, phacelias, red beloperone, scarlet ocotillo and a host more, some, such as the langloisias, the mohavea and the desert stars, as delicately beautiful as hothouse nurselings. And there is one marvelous lily, *Hesperocallis undulata,* as lovely as the Easter lily which it resembles.

The desert even has trees with showy flowers. The mesquite dangles from its thorny branches a thousand yellow catkins which the bees industriously haunt; the palo verde envelopes itself in an evanescent cloud of pale gold, and the desert willow is daintily hung with pale pink flowers, crimson-dotted, almost of an orchid-like quality. Of truly spectacular beauty is the smoke-tree, *Parosela spin-*

THE SPANISH BAYONET

Whipple's yucca of pure and ethereal beauty

C. F. SAUNDERS

A WESTERN VIOLET

Known also as pansy and as Viola pedunculata

VISUAL EDUCATION SERVICE

osa, whose leafless crown becomes in June one mass of indigo flowers, which few people ever see, as the heat at that season is so intense that no one who can help it visits the desert. On the Mohave Desert, which lies from two to four thousand feet higher than the Colorado, the flowers bloom a month or so later, and include many not found at the lower altitude. Noteworthy among the Mohave's sights are the sheets of California poppies in coppery orange visible at long distances—a vivid picture that so impressed Fremont in 1844 that he recorded it in the journal of his march.

The wild gardens of the coastal country generally reach the height of their beauty in April or May. Some of the most interesting are at the very surf's edge. There the abronias trail their fat, leafy stems, and spread little umbrellas of bloom in yellow, red or white, and the curious ice-plant, *Mesembryanthemum crystallinum,* glitters on stem and leaf with the frost-like incrustation that has given rise to the vernacular name. Its cousin, the fig marigold, *M. aequilaterale,* is another characteristic creeper on the California coast, and is curious too. The succulent leaves are like slender, pointed prisms, among which the large magenta flowers with innumerable narrow petals open wide when the sun shines upon them and close when it withdraws. On sunny mesas back from the shore, as well as far inland, brodiaeas and mariposa tulips mingle with the tall grasses and the wild buckwheat in tangled profusion.

VISUAL EDUCATION SERVICE

CREAMCUPS

Up and down the State they lift ivory chalices to the sun

A DESERT LILY

As lovely as the Easter lily which it resembles

GROUND IRIS

A notable member of California's wild gardens

VISUAL EDUCATION SERVICE

The fog-drenched redwood belt, which extends northward from Monterey along the ocean shore for hundreds of miles, is famous for many a woodland beauty, as the redwood rose, the ruby lily, the glossy-leafed huckleberry that enters so largely into California's Christmas decorations, the exquisite *Clintonia andrewsiana,* the redwood sorrel and the western heart's-ease, an engaging little violet in white, purple and gold. From coast to Sierra the dimples and furrows of the foothills grow blue and bluer with massed lupines, pentstemons, phacelias and mountain lilac; suncups, baerias and poppies carpet plain and mesa with cloth of gold. Up and down the State creamcups lift ivory chalices to the sun and baby-blue-eyes, that captivating wilding which is almost as firmly intrenched in the hearts of Californians as the poppy, fringes with azure many a roadside bank.

In the valleys hundreds of acres are solid with the limpid yellow of wild mustard, which sometimes attains twice the height of a man and defies the cultivator as successfully as does the oxeye daisy in the East—a weed, by the way, that is all but unknown in California. Of marked influence, too, in the floral scene are gilias, far western relatives of the phlox. They occur in scores of species, all beautiful and of various hues—blue, pink, yellow, white, scarlet. A quaint little flower that spreads mantles of magenta over plain and hill is the owl's clover, the *Orthocarpus* of the botanists. Each slender stem is topped with

(Continued on page 266)

More Open Spaces

DAVID STARR JORDAN

Our nation was created by sons of English Puritans and of like-minded dissenters, religious or political, from northern Europe. One and all they sought for personal freedom. "They were so obstinate and self-centered that they would have no one to rule over them but themselves". As one of their leaders, Cotton Mather, dolefully observed, "If the people are to govern, who is then left to be governed"? Who indeed? Only interlopers and immigrants, brought in to do the heavy work, of which America has grown tired.

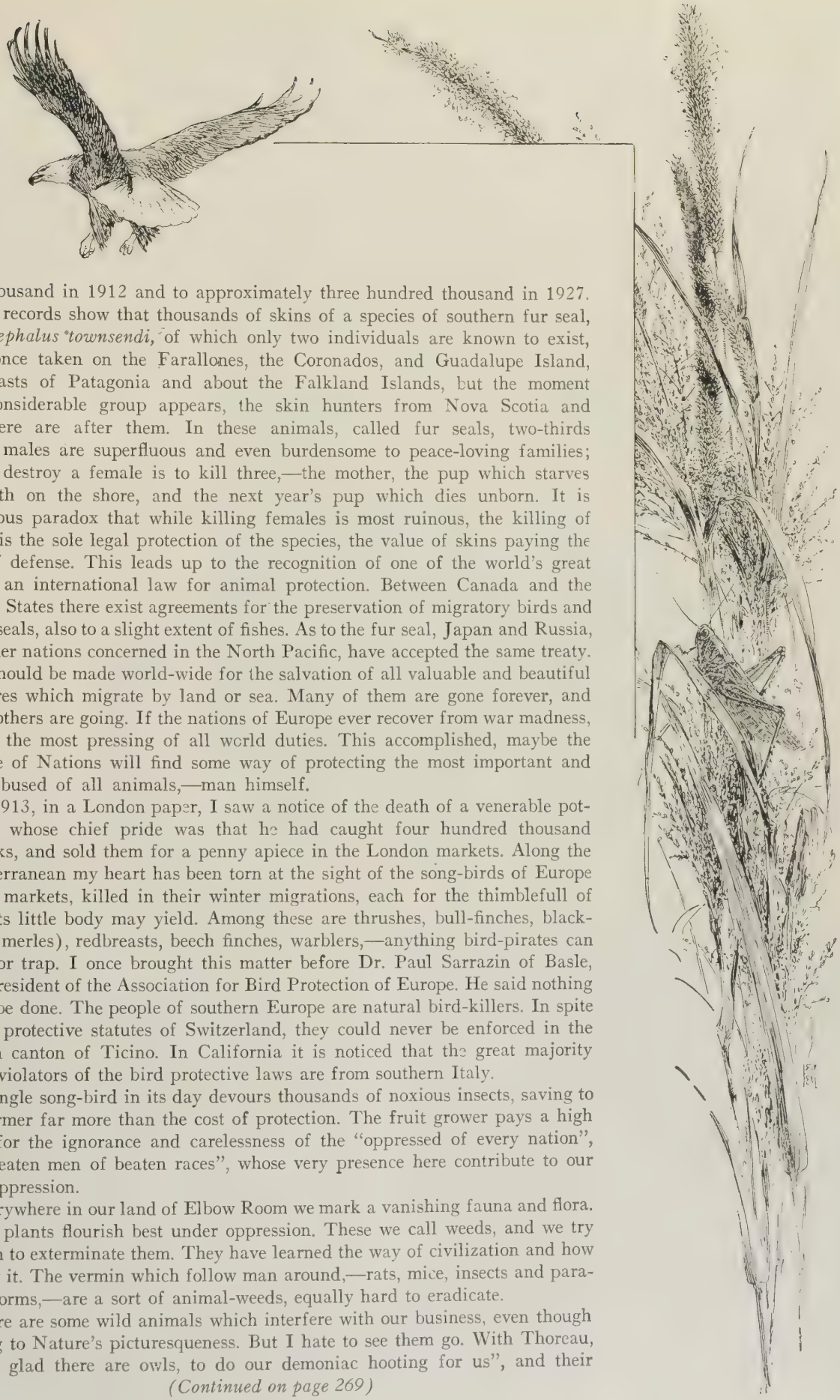
But lovers of freedom framed this republic, and no other type of men could or would have done it. It is now still more than ever their duty to govern by first governing themselves. But that is another story.

We may note that Freedom has several meanings, each one pertinent in our history. Escape from blinding tradition within is the first and highest meaning of freedom. This is to be conscious that one belongs first to himself. A second meaning is that of escape from outside human tyranny. Another meaning is the demand for elbow room. Our forefathers had all these, and in all directions matters are closing up around their descendants. It is a human weakness to fear dissent, to want to see everybody just like everybody else, all cast in the same mould. One language, one religion, one education, one set of fundamentals is demanded not only in medieval Turkey but in modern America, and to all this, the developing sons of the Puritans must ever dissent, even though the ancient Puritans knew little of tolerance, for they had never seen it practised by anybody. As a mass, no people ever got much ahead of their times.

But now as to elbow room. It means contact with Nature, and such contact means care for wild life, of which Nature is partly made up. The best thing said of an early English king was that "he loved the tall deer as if he were their father". A true sportsman he, for he never killed wantonly to fill a bag, to win a bet, or to hang a set of horns as a trophy in his office.

But civilization crowds elbow room. It destroys forests, dries up springs, turns brooks into desolating torrents, replaces the big animals by rats and mice and the insect-eating song birds by English sparrows. This we cannot help, but we can mitigate it, and if we care anything for what our grandchildren think of us, we shall leave some part of Nature unwrecked for their contemplation. To do this, we must get busy, today and tomorrow. In writing of conservation one hardly knows where to begin, or rather where not to begin. The need is plain on every side. When, in 1880, I first came to California I saw limitless herds of the prong-horn antelope scampering over the hills of what is now Wyoming. In the last thirty years I have crossed the continent some seventy times without ever seeing one. And the Rocky Mountain goat—called such, but a far nobler animal than any goat, one of the finest and most unique of all beasts—has become much reduced, and with it the big-horn sheep. When I was a boy in New York every farmer had in his sleigh at least two buffalo robes. Yet were it not for a few Nature lovers the American bison would today have joined the great auk and the passenger pigeon in total extinction.

Sixty years ago the Pribilof Islands, just purchased from Russia, sent forth a million or more of mother seals, each with a pup of her own. Reckless slaughter at sea cut the number down to one hundred and forty thousand in 1897, down to forty-two thousand in 1910, and the species was saved only by fourteen years of hard work, from 1897 to 1911, ending in the protection treaty of 1911. Mothers, thanks to this wise provision, had increased to eighty-



two thousand in 1912 and to approximately three hundred thousand in 1927.

Old records show that thousands of skins of a species of southern fur seal, *Arctocephalus townsendi,* of which only two individuals are known to exist, were once taken on the Farallones, the Coronados, and Guadalupe Island, the coasts of Patagonia and about the Falkland Islands, but the moment any considerable group appears, the skin hunters from Nova Scotia and elsewhere are after them. In these animals, called fur seals, two-thirds of the males are superfluous and even burdensome to peace-loving families; but to destroy a female is to kill three,—the mother, the pup which starves to death on the shore, and the next year's pup which dies unborn. It is a curious paradox that while killing females is most ruinous, the killing of males is the sole legal protection of the species, the value of skins paying the cost of defense. This leads up to the recognition of one of the world's great needs, an international law for animal protection. Between Canada and the United States there exist agreements for the preservation of migratory birds and of fur seals, also to a slight extent of fishes. As to the fur seal, Japan and Russia, the other nations concerned in the North Pacific, have accepted the same treaty. This should be made world-wide for the salvation of all valuable and beautiful creatures which migrate by land or sea. Many of them are gone forever, and many others are going. If the nations of Europe ever recover from war madness, this is the most pressing of all world duties. This accomplished, maybe the League of Nations will find some way of protecting the most important and most abused of all animals,—man himself.

In 1913, in a London paper, I saw a notice of the death of a venerable pot-hunter whose chief pride was that he had caught four hundred thousand skylarks, and sold them for a penny apiece in the London markets. Along the Mediterranean my heart has been torn at the sight of the song-birds of Europe in the markets, killed in their winter migrations, each for the thimblefull of flesh its little body may yield. Among these are thrushes, bull-finches, black-birds (merles), redbreasts, beech finches, warblers,—anything bird-pirates can shoot or trap. I once brought this matter before Dr. Paul Sarrazin of Basle, then president of the Association for Bird Protection of Europe. He said nothing could be done. The people of southern Europe are natural bird-killers. In spite of the protective statutes of Switzerland, they could never be enforced in the Italian canton of Ticino. In California it is noticed that the great majority of the violators of the bird protective laws are from southern Italy.

A single song-bird in its day devours thousands of noxious insects, saving to the farmer far more than the cost of protection. The fruit grower pays a high price for the ignorance and carelessness of the "oppressed of every nation", "the beaten men of beaten races", whose very presence here contribute to our own oppression.

Everywhere in our land of Elbow Room we mark a vanishing fauna and flora. A few plants flourish best under oppression. These we call weeds, and we try in vain to exterminate them. They have learned the way of civilization and how to beat it. The vermin which follow man around,—rats, mice, insects and parasitic worms,—are a sort of animal-weeds, equally hard to eradicate.

There are some wild animals which interfere with our business, even though adding to Nature's picturesqueness. But I hate to see them go. With Thoreau, "I am glad there are owls, to do our demoniac hooting for us", and their

(Continued on page 269)

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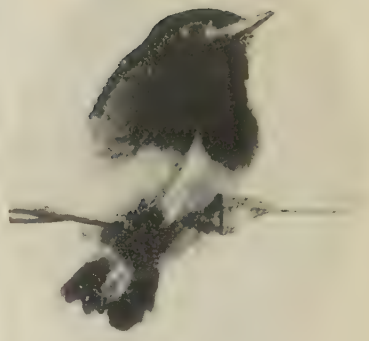
The Glory That is Shasta's Shines
Forth From the Forested Hills



W. L. Finley

Black Phoebe
Is a Fly-Catcher
And Unafraid of Man

The California Quail
Below May Soon Be
The State Bird

W. L. Finley

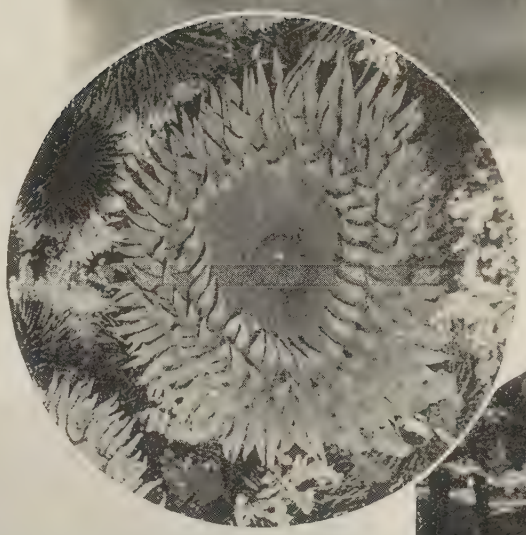
Stibley

An Airy Camp in the
High Sierra

The Mockingbird Takes Off

Keil

Sea Anemones In a Monterey Tide Pool



(Below)

From the Little Cone Comes the Great Sequoia; from the Big One the Smaller Pine

Sibley

A Garden Vista in the Foothills

Keil

Into *the* Valley *of* Death

But Not as Deadly as It Sounds, as This Story Shows

by Arthur Newton Pack

A HUNDRED miles of twisting, turning road—a mere track scraped out of the gravel desert floor. Two automobiles, one following the other. "It's more pleasant to have two cars", our friend in Los Angeles had said. "It makes company, and besides you never can tell—". Off to the eastward gleams a beautiful lake with water sparkling in the sunlight and apparently reflecting trees taller than any of the mesquite or creosote bushes we have been passing. We know it is just such a mirage as the early immigrants viewed with parched throats. Now up a long grade, recognizable only by the laboring of the engine, for in the vast tilted expanse there is no real level for comparison. To the left mountains, naked masses of powdery rock tinted in crazy-quilt design with equally crazy colors; to the right more mountains now draped in black lava as if mourning for something unknown. Ahead a narrowing horizon, slowly attainable by a track which loses itself in the vast emptiness. Up, up,—the horizon seems so close—and then as we top the rise it jumps fifty miles at a stride. We pause. Everything is silence, sunlight, shadows, drifting clouds. What is that streak of brilliant yellow ahead? Why, flowers, golden yellow desert sunshine—thousands upon thousands, thrusting up through the hard gravel by some miracle of Nature! Look, there are blue flowers with delicate pistils and stamens, bluer than ever because the leaves are so few. Phacelia, wild blossom of the mountains. We had seen it in the high northern Rockies, yet it blooms here also in this vast waste. White desert stars, like daisies, thrusting their blooms a bare half inch above the famishing soil and wide open to the sun.

"Come, we must go on. We can't make over twenty miles an hour".

"But we can't see the tiny flowers when going so fast". Down. . . . "We must stop and see that curious dwarf cactus".

"It's only six inches high, but it is going to bloom—perhaps next week".

On again. A car coming towards us. Bump! We climb out of the gravelly rut to let it pass.

An hour passes. Brownie and I look back. We are alone—no following car in sight. "Gosh, I hope we don't have to go back for them; we haven't too much gas. When did you last see them? . . . Let's talk, this waiting is so silent it hurts. Look! There's a swirl of dust! . . . Goodness, it takes a long time for them to come. . . . See how they swing back and forth across the desert floor. The road sure is crooked. . . . At last

DESERT "ASTER"
A lavender-flowered shrub

FULTZ

DEVIL'S GOLF COURSE
In Death Valley 276 feet below sea level, Panamint Mountains and Telescope Peak in background

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A SINGLE PLANT OF THE EVENING PRIMROSE

THE DESERT NIGHT BLOOMER WAKES UP

they are here. No. We didn't hear you blow your horn at all. It's the silence. It swallows everything. You stopped to take a picture? Oh, all right, but you had us worried. Let's go. It's getting late and we're only a little over half way. You lead this time and let us watch you.

"Furnace Creek Inn—54 miles. Do not attempt this road without ample reserve of gas, water, and oil", reads the sign. We consult the map and our gasoline gauges. Not for us. We must go on to Shoshone across the Black Mountains and replenish our supplies. The wild flowers grow in ever increasing profusion. The engines labor now in second gear. "Salsberry Pass, elevation 3,875 feet—Shoshone 10 miles". Thanks be to the Automobile Club of Southern California for these encouraging signs. Down again. Dusk. Darkness. "Say, are these nautical miles or leagues or what"?

Lights—the single dusty track of the Tonopah and Tidewater. Tents, cabins. "Gasoline 35 cents a gallon".

"There's a woman who says she will give us supper. We probably won't get another chance". Interlude for mastication.

"Now stay close together. We can't afford to lose each other in the dark. We've got over 40 miles to go".

"Oh, look—the full moon rising over those mountains"!

"We are going down again. See those weird eroded cliffs. Wait for the other car. Here, I'll turn the headlights on that sign".

"Furnace Creek Inn—10 miles".

"Watch that jack rabbit scurry"!

A bell boy in uniform appeared on the steps of the low adobe hotel. Lovely rooms and a shower with each—and all in the desert. We are just at sea level. Down there 276 feet below is the floor of the valley, the lowest spot in the United States. Those are the Panamints. See the glittering snow in the moonlight 7,000 feet above. Beyond lie the Sierra with Mount Whitney, highest mountain in the United States proper.

A few years ago Death Valley was known to only the hardy few; but so great had been the popularity of Palm Springs in the Colorado Desert that various agencies began to envision capitalizing on this wildest and most unique valley. The Pacific Borax Company built last year the Furnace Creek Inn, a first-class hotel accommodating forty guests. The Automobile Club managed to arrange for conditioning the desert roads

SATIN-STAR
Cream, lavender and rose
FULTZ

HIGH POINT AND LOW
Death Valley. Mount Whitney, our highest peak, is one hundred miles away to the westward

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SHIFTING SANDS OF THE VALLEY
In the background Corkscrew Mountains, Hell's Gate, Chloride Cliff and Funeral Range

from the south, and a Los Angeles man erected a group of bungalow camps some twenty-five miles farther up the valley and constructed a forty-mile toll road across the Panamints, giving access from the west. All this we learned from the smiling manager of the Inn, who in summer manages Old Faithful Inn in the Yellowstone. The indefatigable manufacturers of borax are doing everything in their power to induce tourist travel, even to the extent of bringing in horses every winter to Furnace Creek Ranch for visitors to ride.

Next morning we gladly abandoned the cars and jogged off on horseback, under the guidance of one Bill Sullivan. There had been a trail up this particular gulch, but summer cloudbursts each year change the contour of the powdery clay buttes, and trails do not last. Suddenly we found ourselves on the top of a great mound overlooking a dry creek bed.

"Guess we can get down all right, if you folks don't mind", said Sullivan; and without more ado calmly rode his horse off the edge. The animal adjusted its legs to sliding position and tobogganed down in a furrow of clay-like powder which looked for all the world like snowflakes or talcum. We followed, looking back to watch Beulah and Ingrid as they came in turn.

"Well, I've seen it done in the movies", gasped Brownie, "but I never expected to do it myself".

Sullivan seemed to think that a particularly large joke and led onto more feats of equine gravitation until time to return to the hotel for lunch. Ten days ago we had tobogganed in the Yosemite down a snow slide on a garbage can cover, and here we were at it again, using a horse instead of a can cover and "talcum powder" instead of snow. Even in the dry gravel gulches the flowers —yellow, blue, lavender, and pink —were blooming in such profusion as one might expect only in some lush mountain meadow.

(Continued on page 267)

DEATH VALLEY PIONEER
Eben M. Skillings, one of the first drivers of a 20-mule team borax train

ONE OF THE FIRST TEAMS
Drawn up at Mohave. These photographs by courtesy of Mrs. William H. Savage

J. WALTER COLLINGE

IN A REAL GARDENER'S PARADISE

There are new things to learn about gardening in California and then all is well

The TWO-SEASON YEAR

The Whys and Wherefores of Gardening in California

by Elizabeth Kellam de Forest

President of The Garden Club of Santa Barbara and Montecito

EVERYONE knows that there is no winter in California, but what they do not know is that there is no spring or summer or autumn either! A rash statement which our Chambers of Commerce would frown upon, liking, as they do, to advertise the fact that it is summer all the time; but, from the gardener's point of view, there are really just two seasons, the wet and the dry, and this is especially true of southern California. After the first rains of November, the country comes miraculously to life; the hills turn green seemingly over night; the oaks send forth new foliage; weeds spring up in all the garden beds, and the great growing period for plant life is on. True, there may be cold nights, and in some parts of the state heavy frosts, but the sun of noontide is warm enough to compensate for these.

Now look at the other side of the picture. During the months of drought from May usually until November the country slowly but surely dries up; the creeks stop running in the small canyons; the hills and valleys are the pale yellow of straw; the green of the oaks seems to become rusty and black, and the pungent smell of tarweed fills the dry uplands. Deprived of moisture, the plant world rests.

It is this great seasonal difference that is so bewilder-

ing to the Easterner when he first attempts gardening in the Southwest. Accustomed as he has become to the four well-defined periods which his garden undergoes at home, he finds this two-season system a most topsy-turvy business. How is he to know that sweet peas planted in October, to bloom in December and January, will be infinitely finer than those planted for summer bloom, because the dry, bright days of July and August do not agree with them? Or that, by the same token, the snapdragons that bloom around Christmas are usually the best? And that by pruning and watering his roses at the proper times he can get two or three distinct periods of bloom out of them?

He has many things to learn, this gardener from the East, and one of his first and most important lessons is what the word "drought" really means. Three weeks of no rain in New England causes a mild panic, yet in California he must expect six months of the year at least when, in order to have any garden at all, he must constantly pull around his hose or run water through his irrigation ditches. Of course, if he does not want to water all through the dry months, he can plant his plot with cactus and the drought-resistant shrubs, but that is not his first impulse. He usually wants to fill his first garden with those things he has known and loved in the East. It is only after his eastern lilac has grown very scraggly and refused to bloom satisfactorily that he turns to the ceanothus, the so-called wild lilac of the California mountains, as a substitute; and only after his birch has shriveled through a dry year that he lets the white-barked native sycamore take its place.

L. DEFOREST, JR.

A CACTUS COLLECTION THRIVES

A "border" which requires little water or care despite the heat from a sunny patio wall

It is this division of the year into the rainy and dry seasons that makes California gardens what they are, for climate is the great determinator of what we shall plant and how it will grow. When the favorites of the East and all those plants which love moisture and cool dampness failed really to flourish as they should, naturally the only thing to do was to try out the plant material from other countries of similar climatic conditions. It is all these thousands of varieties of exotic trees, shrubs, and flowers that so impress the visitor viewing California gardens for the first time. The plumed eucalyptus from Australia has become typical of our landscape and gives the same accent to planting as the eastern poplar does. The hedges of cotoneaster and pyracantha from China are doing duty for holly and barberry. There are great green masses of the fragrant pittosporums planted everywhere; streets lined

IN TROPIC LUXURY

Here a fine specimen of eucalyptus dominates the garden

J. WALTER COLLINGE

with acacias of every known variety; heathers from the Mediterranean making a purple note of contrast, and on and on. There seems to be a never-ending supply of this exotic material from which to choose. It takes skill to combine it properly and most effectively, but that comes with experience and knowledge of the habit of growth, form, texture, and color of the plants. Sometimes the new-comer is so enthusiastic over all the new and exciting plants that he sticks one of everything into his plot, making a regular botanical museum rather than a well-considered garden.

Even in the bulb world, those introductions from the drier parts of the earth do better than the English and Dutch favorites. Tulips, hyacinths and narcissus can be made to bloom and bloom beautifully, but it means very great care and much fussing over them. But gladiolus, watsonias, freesias, tritonias, ixias, sparaxis—all that great tribe from South Africa—are most perfectly at home in California and can be relied on to give splendid flowers with the minimum of attention.

An all year round garden—how delightful it sounds! What strides it makes in growth with no cold winter to hold it back! How quickly you can see the results of your labors! But what a chore it is to keep it in bloom all the time! Six or seven months of garden perfection and the grounds that must look their best all twelve months of the year are two entirely different things. The newcomer soon learns to make the most of the masses of his green shrubbery and to let the ever-blooming shrubs supply his color note. He plants great masses of lantana, hibiscus, cassia, and heliotrope, to mention a few, knowing that they will be in flower practically every day of the year. He discovers that perennials are apt to bloom themselves to death and must be renewed every three or four years. He notices that many annuals will bloom any time of the year he wishes, providing he gets their seed into the ground a month or so ahead. By bitter experience he reduces his lawn to the minimum he can properly care for as the dry season is very hard on it and a really good turf takes the constant care of an expert.

L. DEFOREST, JR.

WITHIN A SANTA BARBARA PATIO

The soft foliage of an old mission olive contrasts with dasylirion, yucca and prickly pear

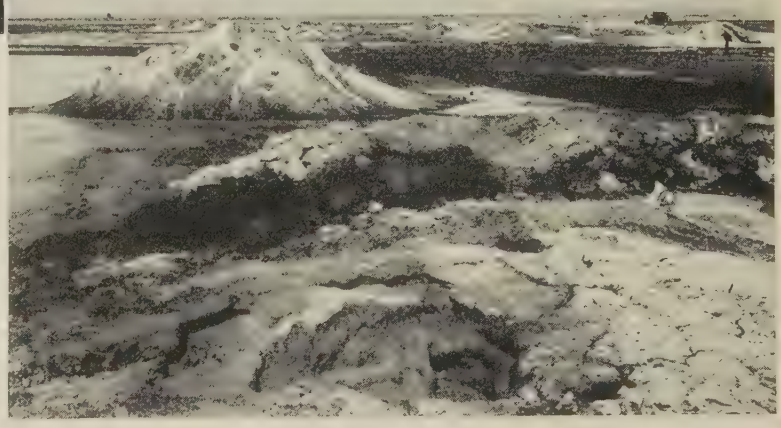
But in a short time our stranger has adapted himself to these new gardening conditions and comes to realize that he is in the real gardener's paradise. What variety, what luxuriance! What a joy it is to have palms and banana trees, poinsettias, gardenias, camellias, and the fragrant freesias. What if he has a twelve month job,—that just adds zest to living and another stimulus to keep him at work.

A HILLSIDE GARDEN

Agave and Echium in foreground with Heline moss in place of grass

J. WALTER COLLINGE

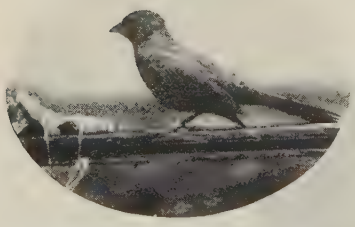
Beside the Devil's Post Pile Men Are But Moving Dots



Salton Sea—Where Mud Volcanoes Boil

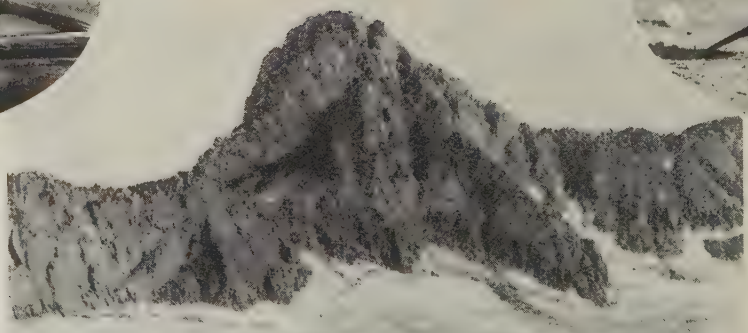
(Below)
Anthony's Towhee, a Shy Southern Californian

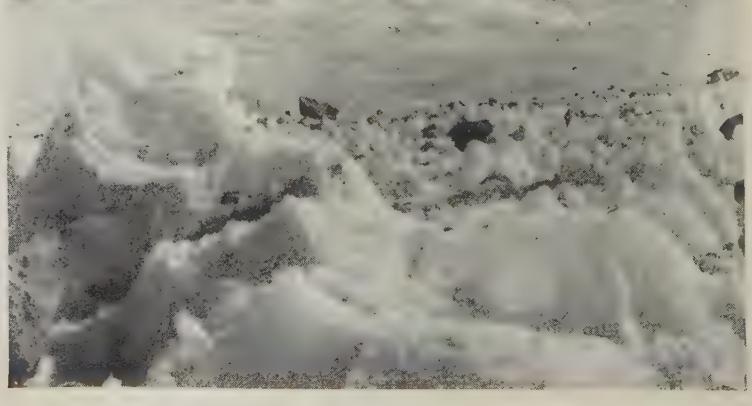
R. S. Woods



W. L. Finley

California's Friendly House Finch, Who Nests in Vines and Trees





Palisade Glacier in the Sierra Nevada

Everywhere One Sees Brewer's Blackbird

W. L. Finley

The Cactus Wren Likes Such Places As the Joshua Tree Pictured Above

R. S. Woods

(Right) In the Foothills Dwells the Thrasher

R. S. Woods

San Gabriel Mission Of Long Ago

Keil

"Woof"

W. L. Finley

NATIONAL PARK SERVICE

MT. LASSEN IN ERUPTION

The only active volcano in United States shows off for National Park visitors

PARKS *of the* GOLDEN STATE

California's Contribution to the National Playgrounds

By Harold C. Bryant

FOUR centuries ago the Spaniards came to California. They came for land and for wealth; they found both and wrested them from the Indian. For three centuries they thrived, built their missions and their gardens, then quietly slipped from view. Later came the gold-seekers, who washed and blasted and bored in the quartz-seamed hills. They, too, found what they sought, some of them, and disappeared. And now still greater numbers are coming to the same mountains and valleys; they are seeking other riches from the ever-bountiful land. These last are Americans, searching for the wealth of the beauty which is their American heritage, ferreting it out in those playgrounds, the National Parks. And like the Spaniards and the Forty-Niners, they are gaining their hearts' desire.

California has four of the nineteen National Parks of the nation. She has, perhaps, the greatest variety of scenery, of climate, of wild life and of flora in her parks that is seen in any state. There is Yosemite, with canyons and towering peaks, with jewel-like lakes and waterfalls, as big as the State of Rhode Island, and offering life forms from those of the near desert to those of the arctic wastes; there is volcanic Lassen, with its lava beds and its pumiced rocks and geysers, which hints of ancient, forgotten days when the world was young; there is Sequoia, which shelters the oldest and largest living things, the big trees, whose kind ruled the land long ages before man; there is General Grant, protecting a monarch four thousand years old. Here, preserved for the nation, is a living tableau of the natural history of the past, a history made before cities contorted coast lines and rivers, before the axe destroyed the great forests and man killed off most of the game,—a history that can be read after these generations are gone.

NATIONAL PARK SERVICE

NICE PUSSY

This young mountain lion is a native of the parks, and feels lazy, thank you

And to these "national outdoor museums of original America" increasing numbers are coming to see

what Nature is like, and how it was before the great herds vanished, and the Indian crept to his reservation. Half a million trekked to Yosemite last year—Yo Semite, named after the Grizzly Bear—the oldest of California's parks. They came to stand at the "Gates of the Valley" to see that great monolith, El Capitan, higher than three Gibraltars, loom over the two-hundred-foot firs, and to see the Bridal Veil Falls leap from the granite; they came to tramp through alpine gardens, and fish in trout-filled lakes.

Even the miners, thirsty for gold, were struck with the beauty of Yosemite, and in 1864 it was secured by the state, to be deeded back to the Government for National Park purposes in 1906. One may ride on horseback for two days straight south from Yosemite Valley, or more than two days on northern trails, before leaving park boundaries. It rises from the hot California plains to the crests of the Sierra Nevada; it is covered with great forests, among which are strewn carelessly great whitened domes and hard-splintered peaks, outcroppings from the granite block of which the Sierra are made. Here are mountain lakes, framing snow-touched peaks on their surfaces; here is the canyon of the Yosemite, made by the torrential rushing of the Merced River for a thousand thousand years.

There is a spell about Yosemite. The trees, changing from yellow pine and incense cedar in the lowlands to white and Douglas firs and sequoia farther up, and then to red fir and Jeffrey pine near the tree line; the glacier-made falls; the towering domes, —they all suggest dignity and majesty and sublimity, and man is little and strange among them. See the fire-fall from Glacier Point, a nightly occurrence in the valley, during which living coals are pushed over a fifteen hundred foot drop; see Half Dome and El Capitan under the light of the full moon, when they are chased silver above the firs, and you will wonder whether you are gazing at reality, or at a beautiful mirage which soon will pass.

NORTH DOME

One of the beauties of Yosemite, which thousands visit each year

The Park, today, is well fitted to care for the thousands of Americans who come to see it. Paved roads lead to all the resorts, which are many and modern. Free camp grounds supply the tourist-motorist; there are bungalows and cottages for the more leisurely, and housekeeping tents for the hardy.

Yosemite Valley, with area of ten square miles, is just a dot in the park's eleven hundred square miles, but it is only lately that the rest of the great vacation ground has been utilized. Trails now network the "back country", however, and a chain of hikers' camps serve as oases for the footweary. You may see Tuolumne River hurl itself down four thousand feet in four miles, and Waterwheel Falls, where water arches for many feet, you may follow a loop trail for a week, and cross ten-thousand-foot passes, wander by alpine lakes, pass through flower-grown meadows and climb summits, sure of finding at the end of every day a cabin and a fire.

A natural history museum and a well organized Nature guide service help visitors to appreciate their surroundings. Lecturers are supplied for evenings, and guides to lead the way along trails and chant Nature's legends to the city-bred. An outdoor school for the training of Nature guides and teachers of natural history graduated its fourth class last summer, and is proud of being the first of its kind.

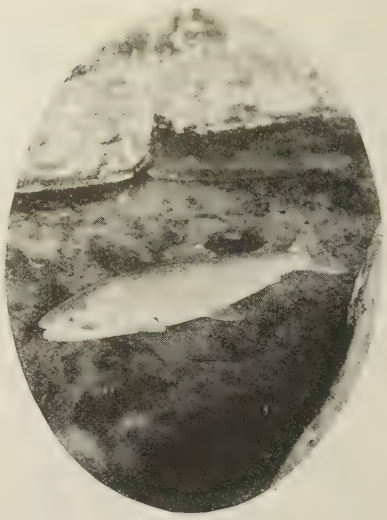
Yosemite offers winter sports among its other bounties, now that the new Merced Valley road, which brings one to Gates of the Valley instead of to the three-thousand-foot rim, as the old road did, opens the park the year round. Tobogganing and skiing are the favorite sports and carnivals are frequent occurrences.

It is the Giant Forest, south of Yosemite, topped to the east by Mt. Whitney, that gives glory to Sequoia National Park. Only in the tropical regions is there greater luxuriance of growth than here. Great sequoias, hundreds of them more than ten feet in diameter and near to three hundred feet high, mingle with white pines, incense cedars and yellow pines in an Olympian council of forest gods, while beneath them the deciduous trees and the flowering shrubs riot in rich tangles. The General Sherman tree, the largest and oldest living thing, rises two hundred and eighty feet. It has a base circumference of more than one hundred and two feet, and a diameter of nearly thirty-three feet. Yet even this tree is dwarfed by the snow-capped peak of Mt. Whitney, the culmination of the Sierra crest and the highest peak in the United States, which, with the famous Kern Canyon, has recently been added to the park. Wild life abounds in the enlarged Sequoia, —bear, mountain lion and friendly deer dwell here, and in Kern Canyon amid the waterfalls and the hot springs, are fighting trout. Sequoia Park is not a place for jazz or citified developments. The spell of the big

YE COMPLEAT ANGLER

Swift-flowing rapids, deep, quiet, shady pools, all alive with fish. A paradise

NATIONAL PARK SERVICE



FINLEY AND BOHLMAN

THE RAINBOW

This trout adds brilliance to park pools, and thrills the visitor landing him

HOW ABOUT SUGAR?

Bears are real Jesse Jameses along the Yosemite highways, demanding a toll of sweets

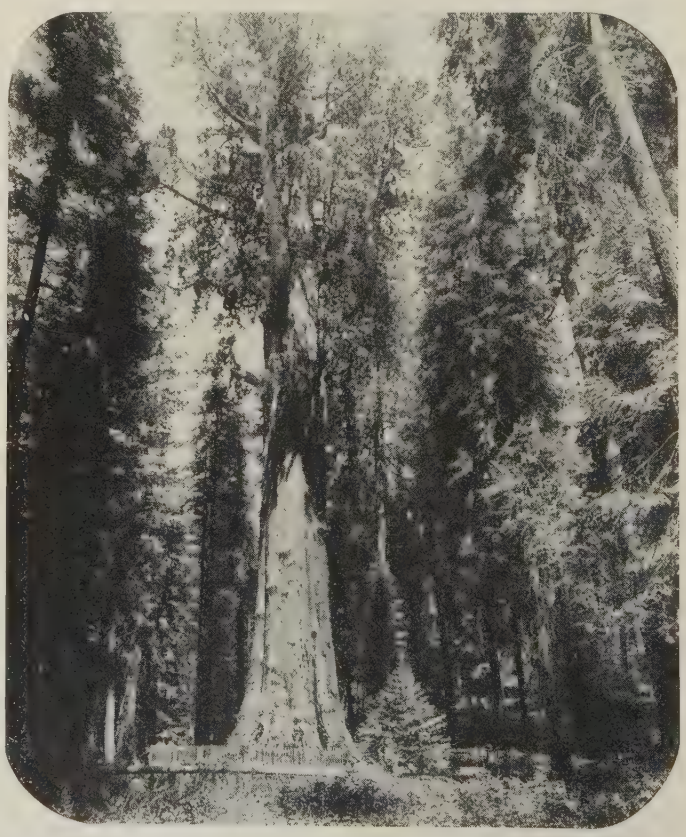
NATIONAL PARK SERVICE

trees rules it, the dignity of greatness is felt. There is good-fellowship, and Nature study, hiking and fishing, with a song and a story in the evening, by the campfire. That is enough.

General Grant National Park was created mainly to preserve the General Grant Tree, the second largest of the sequoias. It is but thirty-one miles by trail from Sequoia, and now is linked to it by a new automobile road. The smallest of the National Parks is this, but its beauty is entirely its own.

The newest of the parks is Lassen Volcanic, created in 1916 after the extraordinary actions of the region brought it to the attention of the world. In the spring of 1915 a new crater on Lassen Peak thundered into action, and lava flowed. Hot gases blew the lava lid off the mountain, and swept through the courses of Lost and Hat Creeks, melting the snow with a suddenness that sent it pouring down the valleys, devastating everything in its path. After such a demonstration, the section was brought into the fraternity of things wonderful. There are hot lakes in Lassen—boiling Lake Tartarus, as fiery as its namesake, —and geysers, mud pots, and mineral springs. There are Bumpass' Hell and Devil's Kitchen and Chaos Crag, the lava remains of an eruption three centuries ago. The color scheme is red and yellow, but alpine lakes nesting against slopes add blue, and primeval forests circling around gives touches of green. Lassen is of a former day, when the world was first forming; it is steeped with the touch of antiquity, and its beauty is much stranger than that of the rest.

Californians and others feel that still another National Park, preserving a sizable forest of coast redwood, is necessary to make the park system complete. The virgin forests of Humboldt and Del Norte counties, they deem, are unique and deserve perpetuation within the boundaries of a park. Action has been started to bring them in, but Congress moves slowly.



U. S. FOREST SERVICE

A MONUMENT

General Sherman Tree, in Sequoia National Park, the oldest and largest living thing

Five National monuments, all administered by the National Park Service, save and perpetuate smaller areas of unique interest in California. The spire-like rocks towering above San Benito county lowlands, called "The Pinnacles" by explorer Frémont, together with nearby fantastic caves comprise the Pinnacles National Monument. John Muir, naturalist, is honored by Muir Woods, a forest of virgin redwood in Marin county presented by a

MARIPOSA LILY

The flower of the "Noona", upon which western Indians feasted years ago

HASKIN STUDIO

FINLEY AND BOHLMAN

A HARD WORKER

Is the Nuthall woodpecker, whose task includes keeping all redwoods free from grubs

MEET OLD HORNY

But the rhino deer of Yosemite passed to deer Valhalla last summer. He will be missed

JAMES V. LLOYD

private citizen. The mad tangle of broken rocks and basaltic columns known as "The Devil's Post Pile" forms another, while Point Cabrillo, first land sighted by the Spanish explorer in 1542, makes up the most southerly tract. The fifth is the Lava Beds National Monument of Modoc County, with unusual rock formations, with inscriptions and paintings of early Indian culture, and with the memory of Captain Jack, who made his last stand here during the days of the Modoc War.

California is rapidly developing a great state park system. The Big Basin State Redwood Park has recently been matched by the Humboldt and Del Norte Redwood Park. Five tracts comprise some thirteen thousand acres, and there are seven state monuments to preserve historic spots. The people are now voting on the advisability of a six million dollar bond issue to match dollar for dollar private gifts for new lands. Great has been the progress in the last few years.

Both the State Parks and the National Parks are game refuges, and big game animals, usually wary and hard to approach, have become tame through years of protection. Yosemite bears hold up automobiles for sugar; deer park in back yards; rabbits and squirrels are bandits *sans peur et sans reproche*. The mountains have their larger animals,—wolverene and bobcat and mountain lion. Birds are abundant,—the California woodpecker pounds his cheerful note the calliope humming bird, the Clark nutcracker and the rosy finch flash about among the others, without fear. Golden and rainbow trout fill the pools. Nature is lavish here, and carefree, and unafraid.

It is not easy, however, to manage these great tracts. One of the great park problems is how to keep Nature natural in the congested areas. Despite regulations, flowers are trampled and picked, canes cut, water polluted. Officials have been obliged in some places to fence off reserves of typical fauna and flora where none but students are allowed, so that biologists of the future may find Nature untouched by the madding crowd. Fire looms as the most dangerous menace to the forests, and a body of rangers are eternal sentinels, watching for signs of that great destroyer,—human carelessness. Another danger has been the scattering of litter, and the tramping down of the soil at the base of sequoias, thus creating unnatural conditions

(Cont. on page 273)

FRASHERS, INC.

A WINTER SCENE

Half Dome glitters proudly in the sunshine, while the pool reflects its grandeur

© 1927, WALLACE I. HUTCHINSON

"When I consider . . . the work of thy fingers . .
What is man that thou art mindful of him?"

Redwood Shadows

by A. Brazier Howell

THE OLDEST living things, of an age scarcely conceivable by anything with a life span as short as man's. Growing larger and larger, taller and taller for hundreds upon hundreds of years, indifferent to the parade of the seasons. These are the redwoods. And not alone are these close-grown patriarchs ancient in themselves, but they come of a venerable race. They are of a tribe of trees that long aeons ago encircled the northern hemisphere. Changes in climate slowly pushed them back until they found their last stand upon our western coast, where temperate ocean currents held at bay the breath of the glaciers during the ice age and now give to them in abundance the moisture they love.

The depths of a redwood forest are like the colonnaded aisles of a great cathedral, with its hush and solemnity. One who appreciates them does not care to live within their shade any more than in the abbey. Rather should one tarry just without the confines of the denser forests, to enter their dim cloisters for a little when in proper mood, to wander adown their winding paths, to marvel, to worship a bit and to go away refreshed in spirit.

From four aspects do the redwoods seem at their best. One, when slant of sun stabbing through the high canopy sends long beams that serve as highroads for descending motes, splashing the great rugged trunks in bright contrast to the somber shadows all about, and dropping in pools of light in which hang motionless fronds of ferns climbing over mountainous decaying logs, and the fairy mosaic of lesser woodland plants.

Or one may come upon some spot where can be seen far away between the brown giants some old woods road with no glint of man-made pavement or speeding monster to intrude its jarring note.

It is soul-stirring to gaze far, far away between the trunks, every leaf in pause, every sound hushed. All life is muted, for every living thing seems to feel the spell. Save for an occasional and furtive winter wren or hermit thrush, or robin which seems to hurry by on distant business bent, the birds shun these forests. Even the furred creatures avoid them, save the moles and shrews which find rich harvest beneath sodden logs.

Rarely may one find some hidden cliff overhanging a flat where the trees are thick crowded, to sit on the brink level with the feathery tops and look far, far down at their brown bases lost in the deep shadows below.

Or one may lie at length upon the yielding bed of age-old humus at the approach of evening when all about the shadows are darkening into twilight, and in the far heights above the setting sun is gilding the incomparable delicacy of the foliage. And as the last rays of the sun fade there comes down the ravine, from out the golden throat of a hermit thrush, the matchless vesper anthem—"Oh, spheral, spheral"—"Oh, holy, holy."

Frasers, Inc.

Rock Creek Lake Mirrors the Mountains Near Lone Pine

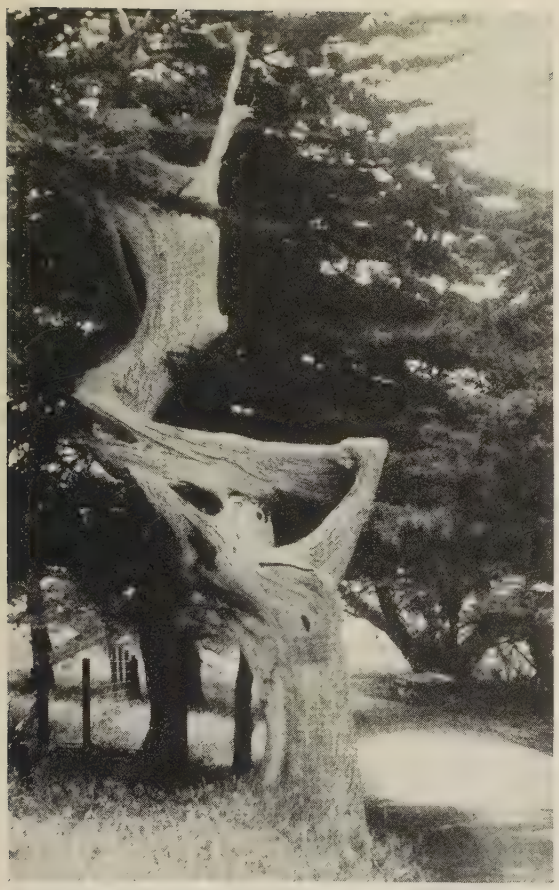
The Elephant Seal's Last Stand

L. S. Stewart

Summer Time on San Francisco Bay, the Home of Many

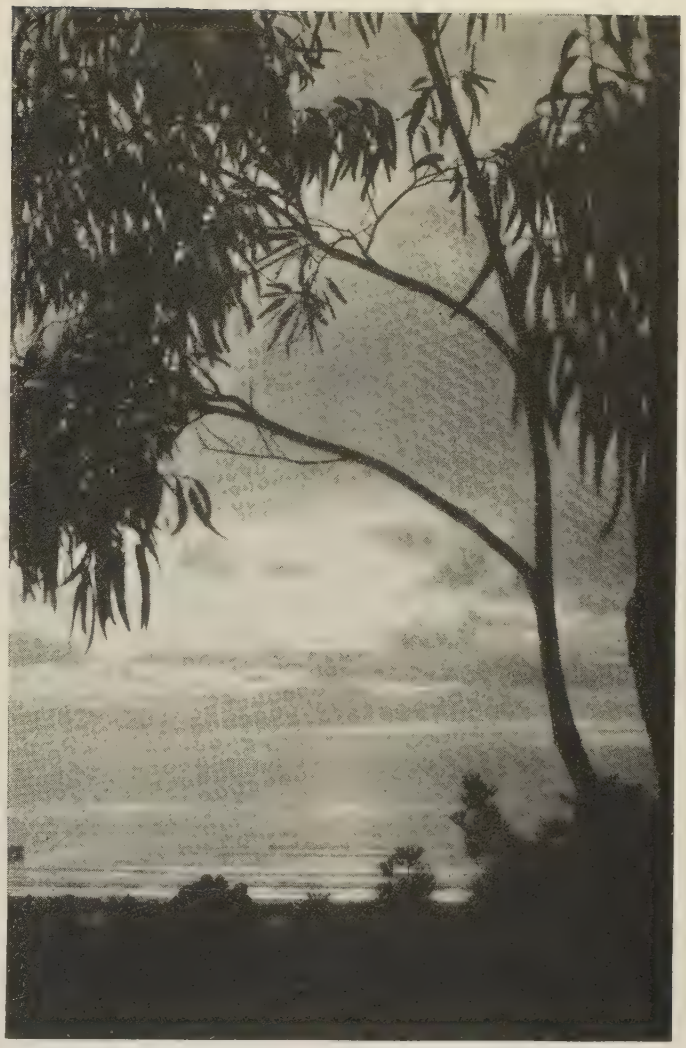
His Highness, the Golden Eagle, Poses with Watchful Eye

W. L. Finley and Bohlman



J. P. Graham

Monterey Cypress on the Seventeen-Mile Drive Near Del Monte



A Silhouette at Sunset on the South Pacific

The Mallard Ducklings Step out for a Stroll

W. L. Finley

Lover Twin Lake and the Crags in the High Sierra

Frashers, Inc.

Museum Work in CALIFORNIA

by Clinton G. Abbott

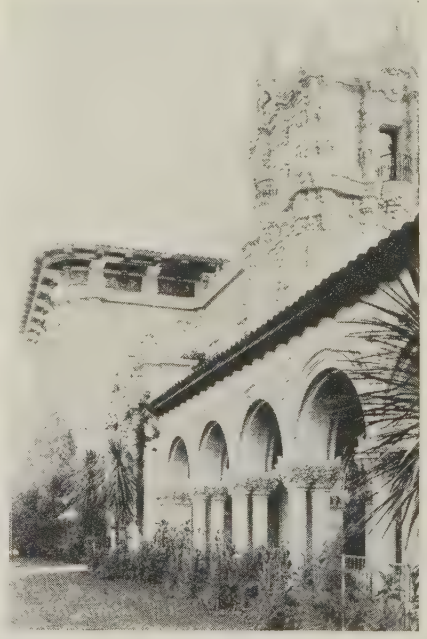
San Diego Museum

THE IMPERIAL GRIZZLY IN MUSEUM GROUP

One of the many fine habitat groups in the museum of the California Academy of Sciences, Golden Gate Park, San Francisco

THE rapid growth of California's population has been reflected in an increasing attention to museums, just as to libraries, schools and other educational institutions. Nevertheless, two of the organizations which maintain museums of natural history in California greatly ante-date the period of large population, and have unbroken histories as long as those to which some eastern institutions point with pride. These are the California Academy of Sciences, whose museum is in Golden Gate Park, San Francisco, and which was founded in 1853, and the San Diego Society of Natural History, which maintains a museum in Balboa Park, San Diego, and was second in the field in 1874.

There are now in California a number of public museums of high scientific standing, situated in San Francisco, Oakland, Santa Barbara, Los Angeles, San Diego and Yosemite. In addition, the universities and colleges of the State maintain museums, the influence and use of many of which extend far beyond the student body. Counting art galleries, the American Association of Museums lists no less than thirty museums altogether in California, a number exceeded only by Massachusetts, New York, Pennsylvania and Ohio. It will thus be seen that from the standpoint of museums, California may rightly be regarded as among the most progressive of the states.



SAN DIEGO MUSEUM

This active museum is in Balboa Park, San Diego

IN THE SANTA BARBARA MUSEUM

Eggs of the now extinct Aepyornis,—one of the seven largest eggs in the world,—and the smallest egg known, that of calliope humming bird

As is to be expected, the activity of California's museums of science is directed primarily toward the natural history of the west, where there is still much to be learned and recorded. Two of the museums, those at Santa Barbara and Yosemite—each a small, specialized unit—confine themselves, in their exhibits, to the natural history of their respective regions. The California Academy of Sciences, whose splendid habitat groups depict the bird and animal life of the western United States and offshore islands in the Pacific, has carried on field work as far away as the Galapagos Islands. The Museum of Vertebrate Zoology of the University of California at Berkeley, a research institution without public display, has been a fountain-head of information on the distribution and relationships of western birds and mammals. The Los Angeles Museum

(Continued on page 269)

ON LOCATION

by Mel Wharton

FROM THE HALLS OF MONTEZUMA TO THE SHORES OF TRIPOLI

Off the Tripolitan Coast,—for which Catalina Islands lend themselves for the moment,—the Constitution battles in the historic film, "Old Ironsides"

SUNSHINE and luck alone are not responsible for the location of the American cinema industry in California. Sunlight is no longer necessary to the making of motion pictures. Nor, in an era of commercial efficiency, can an industry long hope to maintain itself in an illogically chosen geographical position.

Wealth of scenic variety, offering to the cinematographer settings ranging from "shots" of desolate, frigid wastes to the wrinkled, scorched Sahara are within a few miles and a few hours of Hollywood's studios. This feature, with its strategic advantages in time and travel saving, more than any other individual item, has been the compelling force behind the gravitation of cinema production to the Golden State.

To include the extremes of geographical differentiation within the boundaries of a single state supposes vast contrasts. And California has just these! Within her seven-hundred and seventy mile length and two-hundred and thirty mile average width are the highest and lowest spots in the United States proper. Mt. Whitney is the nation's tallest peak, rearing its ice-embattled crest 14,501 feet above the sea. A blazing hot sump in Death Valley is 276 feet below ocean level. And the highest and lowest points can both be seen at once.

From Arctics to Tropics!—Settings within that range are comfortably accessible in a few hours from California studios. So it is seldom necessary to deceive picture fans with artificial outdoor settings. Not at least when the genuine is less than ten or twenty gallons of gasoline distant from the movie capital.

Siberia, Alaska, Canada in winter. Sleighs gliding over the wind-blown snow. A miner lost in the fury of the gale. A "mountie" after his man. All these are taken regularly in the high Sierra, many of them within sound of a rifle's shot from the captivating little towns of Bishop and Lone Pine which owe their present prosperity to the cinema troupes constantly working under the shadows of Sierra's frowning crags.

Sequestered log cabins snuggled beneath spraddling boughs of evergreens become, in winter, the headquarters of the trapper or miner, whichever the script demands. And in summer the rendezvous of the moonshiner and the fugitive from justice or the retreat of the sportsman-financier are readily supplied.

THE TYROL IS NOT FAR AWAY

The Sierra background serves in an Austrian guise, for the filming of Von Stroheim's "Wedding March"

ALONG A CHINESE WATERWAY
The Sacramento River proves to be Oriental enough for filming the picture called "Shanghai Bound"

The lofty Sierra is a perfect "double" for the Swiss Alps. The jagged crags of Mt. Whitney and environs are used in awe-inspiring shots of dizzy, treacherous climbs. The snow fields, ice-glaciers and moraines about Whitney and other peaks form a symposium of Alpine and sub-Alpine scenery. Lakes, some like tiny dew drops on a spread of green velvet,—others of magnificent dimensions like Owens, Tahoe and Mono,—are much pictured in lake scenes.

A brief twenty-five miles separate snow from desert. The desert of the movies is of two kinds; the barren, desperate waste or the palm tree or cactus-grown type.

The creeping dunes adjacent to the seacoast offer inspiring "Sahara" vistas. The vicinity in and about Palm Canyon, Palm Springs and Red Rock Canyon abounds in palm-dotted desert landscape. The Mohave contains a wealth of cactus type. But for the cactus desert the director need not stir from his own lot. San Fernando Valley, just north across the hills from Hollywood, contains several studio-maintained ranchos lush with typical western movie scenery.

But what of the marines? The California littoral teems with treasure coves, mysterious islands and comber-lashed palisades such as, we imagine, delighted the hearts of calloused pirates. Albeit, in truth, during the cradle days of American history the fortune hunters of Spain and Britain right merrily plied their nefarious trade in the very channels which now echo to the megaphoned commands of motion picture directors.

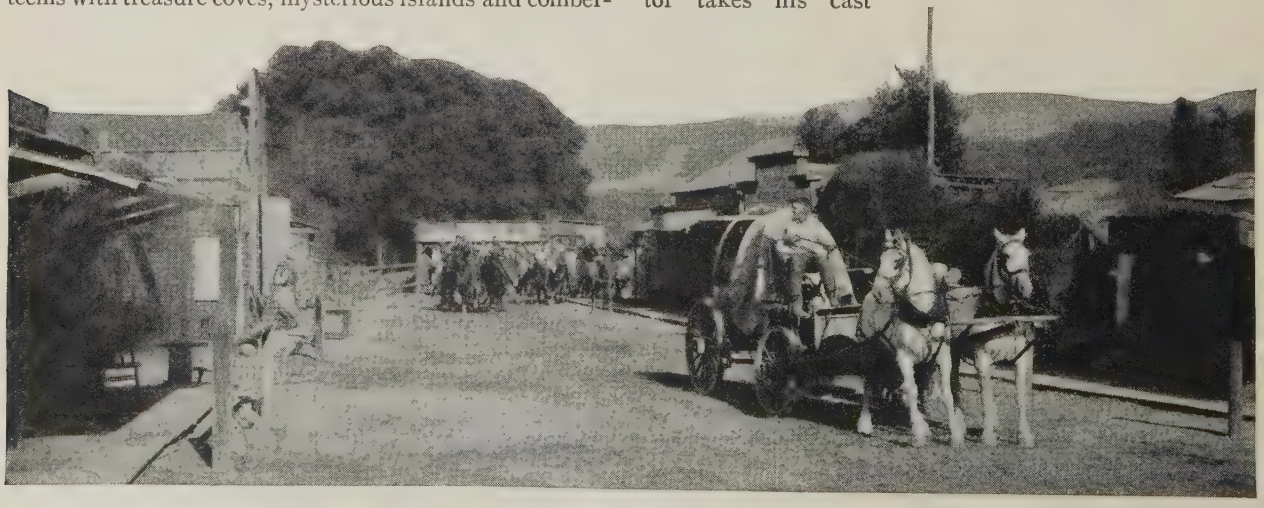
The Catalina Islands and nearby coastal strip on the mainland have been settings for the majority of stories having a marine motif. The shipwrecked duo on a South Sea isle; a pirate's haven; the medieval sea fight; the clipper-ship tale or modern travel epic are all set with equal facility along California's varied shore line.

The silver isles with towering, fronded palms that lie scattered through the 300-mile length of the Catalina group are also the sites of pictured romances of the dusky sirens of the South Seas. Islets of sparkling sand, cozy anchorages, forbidding rock cliffs where villains may be dashed into oblivion, fair, inviting beaches or timber welted headlands are within a few hours journey from Los Angeles harbor.

The California motion picture industry lacks only one setting unobtainable within its own state boundaries. No adequate slums exist. True, there are the rude shanties of the Mexicans and Negro poor, but even the yards of these simple homes are almost invariably alive with the glow of semi-tropical flowers. The slum of the celluloid must be an *nth* degree slum,—squalid, unrelievingly unkempt. So the movie slum must be, of necessity, the artifice of the technician.

For river scenes the California director takes his cast

IN THE OPEN RANGE
Only fifty minutes from Los Angeles for such a western setting



ALL THE WAY TO AFRICA
But why bother when the Mohave Desert provides plenty of sand for the making of "Beau Sabreur"

either to the Kern River near Bakersfield, or the historic and better known Sacramento, which rolls from the foot of Mt. Shasta into San Francisco Bay. The Sacramento has everything a good movie river should have; an abundance of navigable water at all seasons, levees which rival those of the Mississippi, river steamers and barges from whose decks anything from the old cotton picking days during slavery to the gold rushes of the Yukon or early California may be taken. Marshes, weary sand wastes, timbered country or grazing land. All this comprehensive panorama is at the will of the director along the course of the meandering Sacramento, along whose shores much of California's history was written.

Forests. There are the mighty groves of northern California amongst the giant sequoias. The redwoods, too, have formed the background for many alluring and scenically beautiful pictures. Nearer to Hollywood are the delightfully wooded hills and dales of Mono and Inyo Counties, with their stately pines and white water rivulets.

California has her Venice which need not be "manufactured" at the studio. The canals of Venice-by-the-Sea, about a dozen miles due west of Hollywood, when touched up a bit with shiny gondolas and a few shore sets, become the picturesque waterways of the Mediterranean Venice of the screen.

The tuna fishing fleets, the coastwise "tramps" and the transoceanic liners that berth at Wilmington, Los Angeles harbor, San Pedro, Long Beach, San Francisco or San Diego offer a variety of waterfront subjects from the "Cape Cod" halibut schooners to the palatial "Atlantic" steamer. The Pacific battle fleet with its cruisers, submarines, battleships and destroyers has formed the nucleus of many a thrilling naval battle.

Half a dozen deserted cities,—the relics usually of flash-in-the-pan mining days, have proved valuable in shooting pictures of desolation, or "ghost" stuff. Among the better known are the shadow towns of Rhyolite, Aurora and Skidoo. Then there is Death Valley with its bleaching bones and abandoned borax mills of 20-mule-team fame, which have been "shot" in numerous productions.

The air, just now coming into its own, is destined for an ever increasing spot in motion pictures. The greatest American concentration of airplanes and seaplanes is in and about San Diego and Los Angeles.

So it has come that California, the Golden State, has become noted for its robust lack of temerity in shouting its picturesque virtues to the world. But, as we have seen, not without the vestige of a considerable amount of truth, as many of our movie fans will testify.

A MOUNTAIN FASTNESS
"The Wedding March" *was largely taken in the Sierra near Bishop*

NORFOLK ISLAND PINE
A tree introduced from south Pacific

C. F. SAUNDERS

BUNYA-BUNYA TREE
Brought to California from Australia

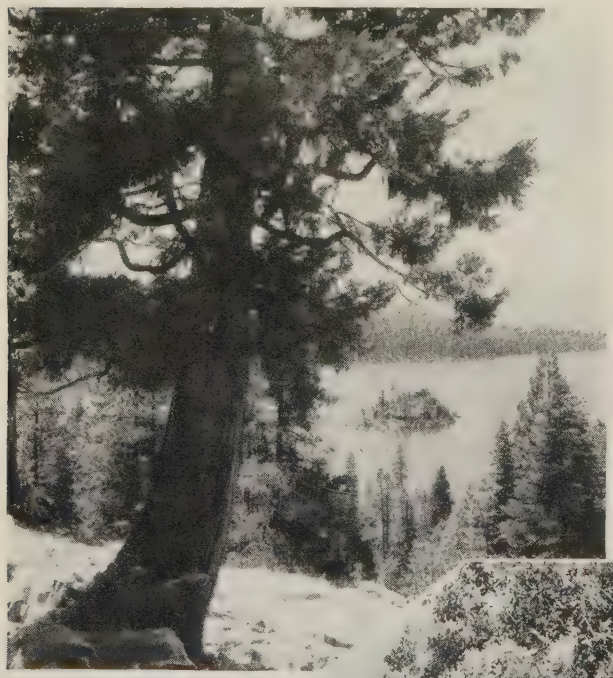
C. F. SAUNDERS

CALIFORNIA'S WAYSIDE TREES

by Charles Francis Saunders

As I walk from my home in the California city where I live to the public library, a mile distant, I am greeted on every hand by trees and shrubs a list of whose lands of origin would include almost every country of the globe, all growing happily together in the open, flowering and setting seed as effectively, in most cases, as in their old homes. Outstanding in this cosmopolitan assemblage is the eucalyptus, particularly the species *globulus,* popularly called blue gum. So well does it fit into the scene that it surprises many to learn that its appearance in California is of rather recent occurrence, and due to seeds sent up from Australia. Planted first in the late fifties as a curiosity, because of its remarkable rapidity of growth—ten or twelve feet a year, or even more—it gradually gained a place in the hearts of the people for more substantial reasons—its value for shade, fuel, bee pasture,—the flowers, expanding in winter, are a notable source of honey,—for picturesque beauty and the pungent fragrance of its foliage, which furthermore is supposed to have medicinal worth.

But not all eucalypts are blue gums. Out of Australia's two hundred and fifty species or so, there are,



VISUAL EDUCATION SERVICE

INCENSE CEDAR ON LAKE TAHOE'S SHORE
One of the most beautiful of native trees

A LIVE OAK SPREADS ITS EMBRACING ARMS
A notable tree found in Santa Barbara County

C. F. SAUNDERS

A FEATHERED PALM
Cocos plumosa introduced from Brazil
C. F. SAUNDERS

THE MONKEY PUZZLE
A tree as funny as its name implies
C. F. SAUNDERS

besides the blue gum, perhaps a score fairly common along California waysides. One is the graceful sugar gum, whose feather-duster crown, so delicately etched against a clear sky, is a favorite subject with artists; and there is the scarlet-flowered *Eucalyptus ficifolia,* which, though rather dwarfish, is a thing of splendor when, in late summer, its crown is aglow with the clusters of vivid flowers. Of a more ethereal beauty is the blooming of the variety *rosea* of *Eucalyptus sideroxylon,* the red iron-bark. It is rather easily recognized by its furrowed reddish trunk, curiously blackened in mature trees as though scorched, and by its drooping branchlets silvery of leaf and laden in late winter with tassel-like old-rose flowers, which the bees haunt.

Hardly less a feature of Californian waysides than the eucalyptus is the pepper-tree. It, too, is an immigrant, arriving during the Mission period. The oldest known specimen in the state stands beside the walls of Mission San Luis Rey. It is the last of several once growing there and may be a hundred years old. The seeds are thought to have come from Mexico, where, shortly after the conquest, the striking pepper was introduced from Peru; and to this day Mexicans call it *árbol del Perú,* that is, tree of Peru. At the approach of winter the feathery foliage of the pistillate form is brightened by countless racemes of currant-like berries, which persist for months to the great satisfaction of the birds. In spite of its name, the pepper is not the source of the condiment so called, but is a relative of the sumacs.

Acacias reached California about the same time as the eucalypts, and, like these, from Australia. Similarly, they have the merit of being evergreen and rapid of growth. From December well on to the advent of summer they present a suc-

VISUAL EDUCATION SERVICE

A LONE MONTEREY PINE ON ITS HILLSIDE
One of the characteristic native trees

THE PICTURESQUE MONTEREY CYPRESS
Photographed on Pt. Lobos, Monterey County

VISUAL EDUCATION SERVICE

cession of golden bloom, but the great show is in early spring; and there is one species,—the *floribunda* of the nurserymen,—which can be counted on for blossoms virtually every month of the year. If you are of a systematic turn as well as observing, you will soon notice that the foliage of all acacias falls into two distinct classes. In one case the leaves are feather-leaved; in the other they are entire, simulating those of a eucalypt. As a matter of fact, the latter sort are not real leaves at all, but the broadened footstalk of leaves that never develop blades, and are properly called phyllodes. Nevertheless they fulfill the functions of leaves so the plant is none the worse for the lack of the latter. *Acacia melanoxylon,* the blackwood, a favorite planting because of the dense shade it casts, is of this sort, furnishing an example of that curious anomaly, a shade tree without leaves.

Among trees that add to the comfort of shade the double grace of interesting foliage and beautiful flowers is *Grevillea robusta,* the Australian silky-oak, with coarsely cut, fern-like leaves and showy orange flowers in one-sided racemes, which fairly reek with nectar. You may have seen it, a flowerless infant, in florist's shops, grown as a pot plant for indoor adornment.

More delicately made up is the Brazilian jacaranda, of which there are many splendid avenues in the south. The finely-divided foliage suggests the ample fronds of some tree-fern, and at summer's threshold it becomes glorified by masses of violet flowers worth a special pilgrimage to behold. Another famous sight, of a different kind and occurring earlier in the year, is the camphor-tree's change of leaf. This delightful tree is a native of China and Japan, and the source, by the way, of commercial camphor. All winter it has interested you with its trim, camphor-scented foliage, studded with beady black berries. It is remarkable for a habit of dropping its leaves, not in the fall, but in earliest spring. Soon after New Years', the foliage, leaf by leaf, turns crimson and gold and then showers down. At the same time the new leaves burst their buds and issue in tones of pink and rose, so that the whole crown is haloed with warm color, easily mistaken for a profuse bloom.

Sometimes confused with the camphor is *Sterculia diversifolia,* another Australian, much planted under the name of bottle-tree. The small, glistening, long-stalked leaves, responsive to every breeze, suggest the aspen. In May the tree courts the bees with a multitude of flowers in shape like lilies-of-the-valley, whitish without and dull red within, crimson-dotted,—an endearing blossom.

VISUAL EDUCATION SERVICE

SEVERAL EUCALYPTS ARE ADOPTED TREES

These are found on the campus of Stanford University at Palo Alto and have taken readily to California climate

Among indigenous trees occurring on California waysides are the lordly coast live oak, *Quercus agrifolia,* which has been the admiration of every traveler from Vancouver's time to this, and several fine conifers, such as the two sequoias, the incense cedar, the Lawson and Monterey cypresses and the Monterey pine. With such outstanding material to draw from, California could have done well without going beyond her own borders for coniferous trees. Nevertheless she did, and one of the most beautiful of these cone-bearing importations is the Himalayan cedar, the deodar of Kipling's stories. Of recent years one particular planting of deodars in Cali-

(Continued on page 272)

CANARY ISLAND DATE PALMS

Donors of tropic atmosphere, these trees

© STEPHEN H. WILLARD

THE SIERRA REARS ITS BARRIER BULK

ATOP the SIERRAN BARRIER

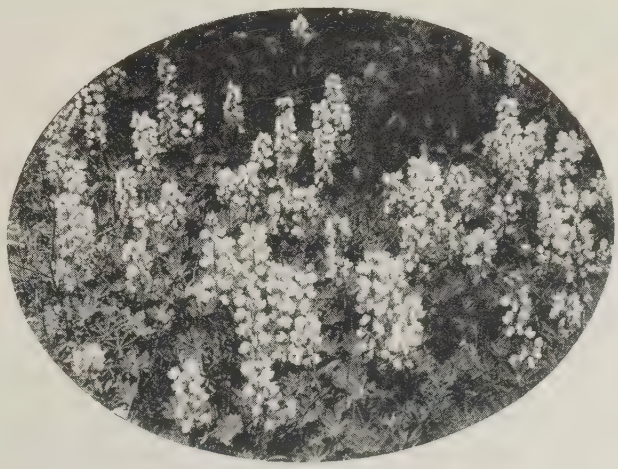
Mightily It Controls Wild Life on Its Flanks

by Roland Case Ross

Nature Study Department, Los Angeles

A FEW days ago we were in sagebrush country, where mile on mile of plains and hill upon hill of mountain border were gray unending sage. Just now we roll along boulevards threading the borders of brown hills and cutting across straw-yellow plains; the Sierra Nevada separates the gray sage from the brown grass and though both are cattle country there is little in common—only dryness. Even as the feed and ranges differ, so do the cattlemen and their customs. The sage of the Great Basin is practically unfenced and the cowboys ride range two months at a time and live on beans and bacon and coffee. The stubbled hills and plains of California inland are fence-cut and the ranchmen ride home for meals. It is not strange that Owens Valley folk should have an edge for California southland: Owens Valley is severed from us by the Sierra, but most of the jackrabbits up there hold citizenship in both Nevada and California. It is like the Great Basin in climate, vegetation and business.

Over on that east side we saw magpies about the ranches. We also find them here in this range country from Santa Barbara north. But note the difference. Here it is a California species, the yellow-billed magpie; across the Sierra it is the black-billed. This but adds emphasis to the effective barrier our mountains are. The black-billed magpie is wide-spread and lives on both sides of the Rockies, but the Sierra limits this ranging. So it is with the great sage grouse: there are none west of the mountains.



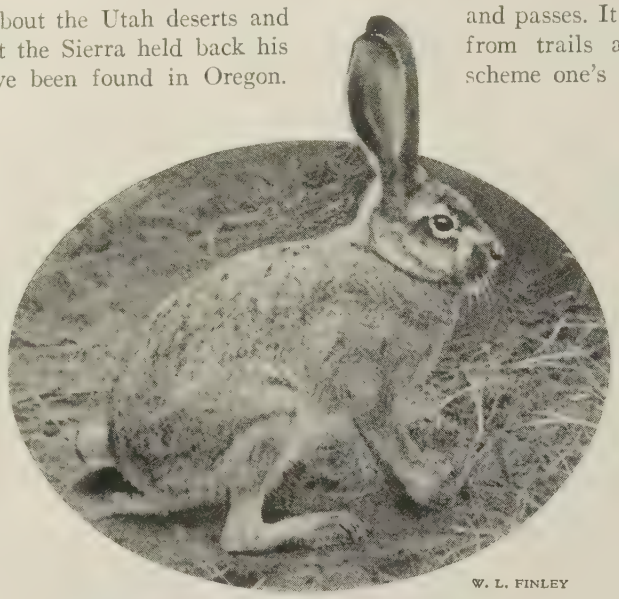
ONE FINDS LUPINE, TOO

We can find time to bask amidst it in some sheltered spot

A little sage spills over and runs down the two great interior valleys of California and in such places are found the sage and Brewer sparrows, birds of the Great Basin. Yet the bush-tits, active little travelers, like the magpie are distinct species east and west of the divide. The

sagebrush chipmunk also does not cross, but another chipmunk inhabits brushy spots on the Pacific side. The black-tailed jackrabbit of the Basin is a shade off color and noticeably lankier than our jack of the Great Valley. The plains buffalo crossed or rounded the Rockies and found a way about the Utah deserts and reached Pacific territory, but the Sierra held back his herds. Recently remains have been found in Oregon. Indian records show that the buffalo entered from the north and not the east through the Great Basin sage plain.

When one essays to climb over these granite and volcanic barriers it is easier to appreciate the territorial limitations of chipmunks and birds. Just for love of the unspoiled wilderness we climbed up the slopes and among the cresting cliffs inevitable on the east face. Over the tumbled rocks and through the catchy scrub it was slow work; yet the increasing view from every breathing place repaid the patient plodding. An hour and we looked into Nevada; two hours and we saw blue to the north, Mono Lake in sagebrush haze. Another hour wrapped us in the reaching flanks of deep passages, shutting out all but the backward view and urging us up with ever higher skylines, like renewed but unfulfilled promises. Four hours, and cliffs, bosomed with snowfields, mirrored in foot-basins of icy water, freshened with tingling winds quashed our ambition to cross uncharted skylines. Shivering down a fountain watercourse, we soon cuddled in a grassy hollow the wind never knew about and there basked amidst tiny yellow mimulus, wild iris and white lupine. Fuzzy cotton tufts upon the scanty soil between rocks we picked up and found to be swollen rounded pods of an alpine loco weed. All morning we had seen them, but it took weariness to get us down where we could see new things. Rattlepods, as loco weed pods are called, are big as walnuts in the valleys,—here the pod was as big as a single pea, and so fat and fuzzy. The whole plant did not cover a silver dollar in size—an insignificant dwarf!



W. L. FINLEY

THE BLACK-TAILED JACK RABBIT

He of the Basin is a shade off color and lankier than the jack of the Great Valley

C. F. SAUNDERS

LUXURIANT WILD BLUE IRIS

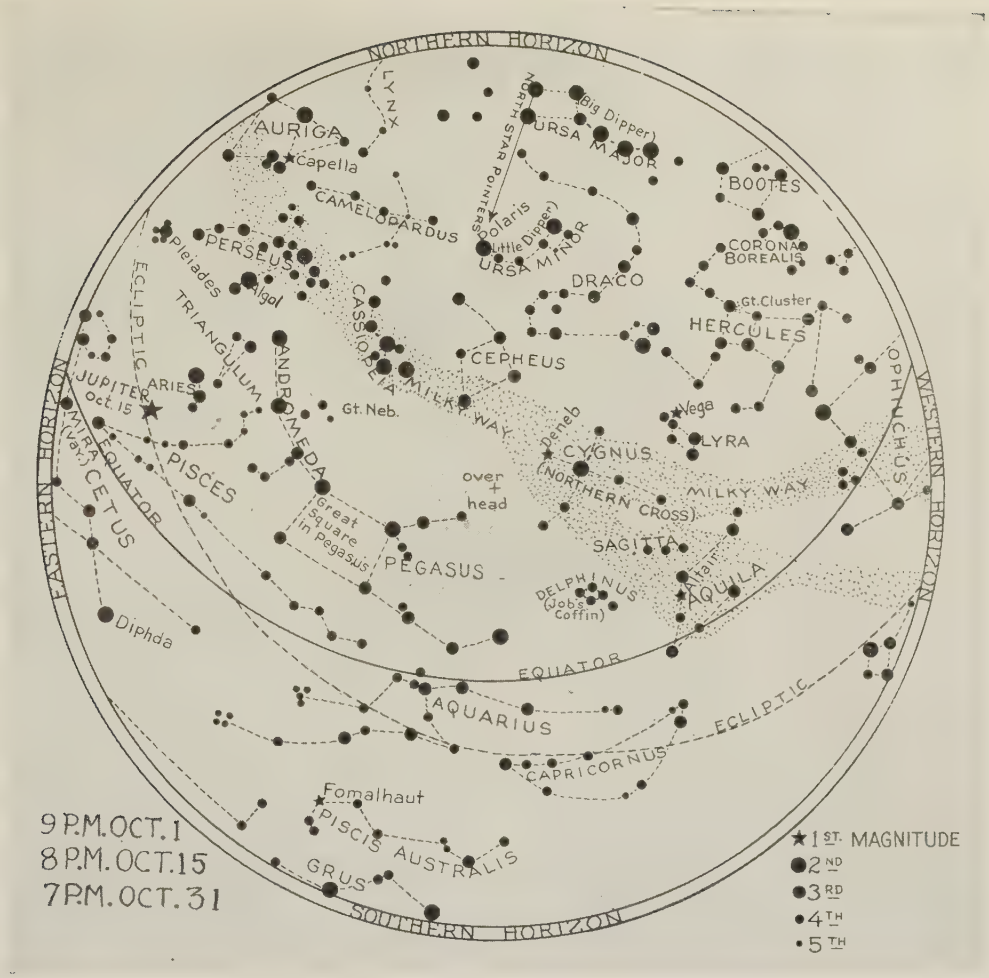
It prospers in grassy hollows which the wind knows nothing about

At such elevations and against foes like wind, rock, cold and weakening vitality it is no wonder the wild creatures fail to push over and invade the regions beyond. We did climb over, a number of times, but always along the known routes through gaps and passes. It was a delight to break away from trails and maps, to blunder and scheme one's way through the rocks and forests, but it didn't get one far. For mileage and getting there the ancient paths were best. Yet the wild folk unacquainted with high mountains had no knowledge of gaps, trails, and easy grades and to this day few have climbed across.

The inhabitants of high country are perfectly at home, one side of the Sierra or the other. The conies found the rock slides of the east just as tumbled and safe as on the west. Mule-tail deer seemed to find less food here than on the moister coast side and throughout were fewer in numbers. The gray squirrel was missing and not strangely so,—he is a low mountain dweller. But his higher cousin, the Douglas squirrel, cut red fir cones as big as ever, though the forests were not nearly so dense nor the trees so tall. The picket-pin ground squirrels never missed a meadow in all the high eastern regions we tramped about and copperheads and chipmunks thrived in every forest. On peaks above timberline the alpine chipmunk scampered, not knowing the steeps that lay below him.

Robins and thrushes in the openings, mountain bluebirds in the meadows, chickadees, juncos, creepers, and hairy woodpeckers in the forests made the region one with the western side. Yet when the nuthatches came tooting by in the lodgepoles they were the rare red-breasted kind and not the white-breasted. A bit of reflection takes away some of the thrill of this last discovery, for the red-breasted nuthatch is a bird of high forests and therefore is the one to expect on the Nevada side where all the forests are high and to his liking.

(Continued on page 274)



TO USE, HOLD OVER THE HEAD WITH TOP TOWARD THE NORTH

California's GREAT OBSERVATORIES

Lick and Mount Wilson Spell Eminence in Astronomy

by Isabel M. Lewis

WITHIN the State of California are located two of the greatest observatories in the world. They are Lick Observatory, the astronomical department of the University of California, and Mount Wilson Observatory of the Carnegie Institution. On Mount Hamilton, twenty-six miles from San Jose and more than four thousand feet above sea level, the telescopes of Lick are trained on the celestial bodies. On the summit of the six-thousand-foot Mt. Wilson and sixteen miles from Pasadena, the astronomers of Mt. Wilson keep watch.

The sites for both of these mountain observatories were chosen with special care with a view to having as many clear days as possible during the year and an atmosphere of more than average steadiness and transparency. The sites finally selected have proved to be exceptionally favorable in both instances. In some years on Mount Wilson observations have been made on more than three hundred of the three hundred sixty-five days.

James Lick, the founder of the Lick Observatory, by deeds made in 1874 and 1875, charged a board of trustees to spend the sum of $700,000 for purchasing land and constructing a telescope which should be "superior to and more powerful than any telescope yet made" and for the erection of "a suitable observatory to be made useful in promoting science". The type of telescope finally chosen was a 36-inch refractor, the lens for which was figured by Alvan G. Clark, with a corrective lens of about 33 inches to be used in photograhic work. At the time of its erection it was the greatest refracting telescope in the world, but it is now surpassed in size by the 40-inch refractor of the Yerkes Observatory, and, of course, by the great reflectors of the Mt. Wilson and Dominion Astrophysical Observatories, which are telescopes of a different type.

The lens of the great refractor proved to be an ex-

ceptionally fine one and it has a long record of valuable service both in visual and photographic work. The fifth satellite of Jupiter was discovered with this instrument by Barnard in 1892 and the ninth satellite photographically by Nicholson in 1914. One of the most important pieces of work undertaken with this instrument and one which has recently been completed after years of painstaking observation and measurement, has been the determination of the velocity toward or away from the earth (radial velocity) of practically every star of five and one-half magnitude or brighter visible in this latitude. Observations of the stars of the southern hemisphere lying below the horizon at Lick were made at a branch of the Lick Observatory in Chile so that nearly all the naked-eye stars in the heavens were included in the survey. This is a monumental work of the highest degree of astronomical accuracy and refinement that will be of great value to astronomers in many investigations. One result obtainable from it is a knowledge of the direction through space in which our sun with its satellites is moving. This has been found to be in the general direction of the constellation Hercules.

In addition to this work and the observing of comets and satellites, much valuable work has been done with the great Lick refractor in planetary observations. At the last close approach of Mars thirty-two drawings of the planet and about fifteen hundred photographs were obtained, many of these with the aid of specially dyed plates. These are of great value in interpreting the nature of the changes that are continually taking place on the surface of the planet. The planet Jupiter was also observed in the same manner and some strikingly interesting and valuable photographs were obtained of this celestial body.

Another important piece of work that has been carried on for many years with this telescope by such noted observers as Burnham, Hussey and Aitken has been the observation and cataloguing of thousands of double stars and the discovery of many new ones and the calculations of the orbits of many of them.

In addition to the great refractor the Lick Observatory has, among other instruments, a twelve-inch and six-inch refractor and the great three-foot Crossley reflector which was formerly the property of Edward Crossley, M.P., of Halifax, England and which he presented to the observatory in 1895. This instrument has been a great aid to the 36-inch refractor, particularly in the photography of regions of the Milky Way and of the nebulas which require great light-gathering power such as is obtainable in a greater degree from the reflecting type of telescope.

No account of the work of the Lick Observatory should leave unmentioned the long series of eclipse expeditions financed by the generosity of friends of the observatory which has made possible the observation by this institution of nearly every total eclipse of the sun since 1888 in all corners of the earth. A long record of valuable photographs for future study and research has thus become the property of the observatory. One of the most valuable results of these expeditions has been the striking confirmation of the famous Einstein prediction which was obtained through the observation of the total solar eclipse of 1922 in Australia, by the Crocker Eclipse Expedition of the Lick Observatory.

The Mt. Wilson Observatory in Southern California has the honor of possessing the largest reflecting telescope in the world, known as the 100-inch Hooker telescope. It also has a 60-inch reflector and three telescopes specially designed for the observation of solar phenomena such as sunspots, solar prominences and solar disturbances of many varied kinds. The great reflectors would not be suitable for this purpose as they would soon be so distorted by the solar heat that they

THE LICK OBSERVATORY AT MT. HAMILTON

Ideally situated for astronomical work, it has contributed greatly to the science to which it is dedicated

would be useless for accurate observations. The Snow telescope, a great horizontal telescope provided with a series of reflecting mirrors, and the 60-foot and 150-foot tower telescopes, which throw images of the sun by means of reflecting mirrors from the tops of the towers to underground observing rooms and to powerful spectrographs in deep wells beneath, make possible the observation of solar phenomena of many varied kinds. An image of the sun 16 inches in diameter is obtained with the 150-foot tower telescope.

It was intended originally that the Mt. Wilson Observatory should be devoted to solar research and it was known at first as the Mt. Wilson Solar Observatory. The sun, however, is but one of the stars, and to understand and interpret its phenomena it is necessary to study the nature of stars in general as physical bodies. So the scope of the work of this observatory was extended to include stellar as well as solar phenomena.

The value and importance of the observations that have carried on and the discoveries that have been made at the Mt. Wilson Observatory are so great that one can scarcely name even the most important of them in limited space. Hale's discovery of magnetic fields in sunspots as well as the fact that the sun itself is a magnet with its magnetic poles close to its poles of rotation, and that sunspots are great solar storms of cyclonic nature, seem to stand out among the numerous discoveries that have been made regarding the nature of solar phenomena. There has been the accurate determination of the wave-lengths of thousands of lines in the solar spectrum of inestimable value to the physicist as well as the astronomer. The great reflectors have enormously extended the limits of the visible universe and have revealed a wealth of detail in nebulae and star clusters. They have made possible Dr. Hubble's remarkable discoveries regarding island universes millions of light years distant. Possibly greatest of all has been the feat of measuring the diameters of some of the giant stars such as Mira, Betelgeuse and Antares, something that seemed beyond the limits of possibility thirty years ago. It was the Michelson interferometer attached to the 100-inch reflector that made this possible.

Last, but by no means least in value, is the educational work that is being done by both of these institutions. Astronomy is in a flourishing condition on the Pacific coast, thanks largely to the influence of these two observatories, which, through lectures by members of their staff and the publications of the Astronomical Society of the Pacific, to which they so largely contribute, have made popular astronomy truly popular in California. Visitors' days at Lick and Mt. Wilson occur weekly and the public gladly avails itself of the opportunity offered to visit these great institutions. The broadening and ennobling influence of great observatories especially when they are in charge of astronomers who are willing to give a portion of their time, valuable as it is, to aid and encourage the cause of popular astronomy is one of the finest features of modern astronomy.

Turning now to our star map for October we find that Pegasus and Andromeda are high in the eastern sky. The rather inconspicuous constellations of Capricornus, Aquarius and Pisces fill most of the southern sky below Pegasus, Delphinus and Aquila. Fomalhaut is the only first magnitude star visible in the south. Cygnus and Lyra are now west of the meridian while Cassiopeia, Cepheus and Draco are conspicuous in the north. The Milky Way is especially beautiful on clear moonless nights at this time of year, arching high across the heavens from the northeastern to the western horizon. Its course can easily be traced from Auriga on the northeastern horizon through Perseus, Cassiopeia, Cepheus and Cygnus to Aquila and Sagittarius, and by another branch from Cygnus to Ophiuchus. The Big Dipper is

(Continued on page 275)

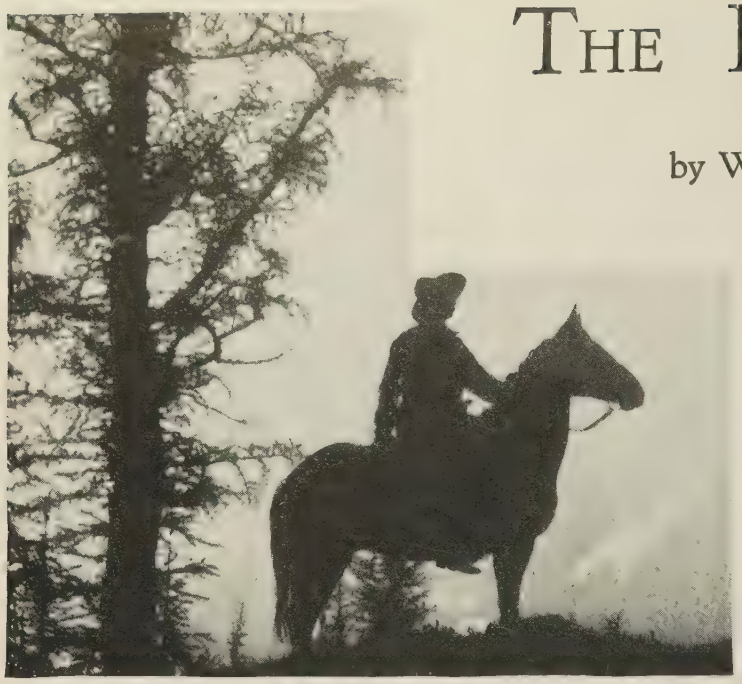
MT. WILSON OBSERVATORY FROM THE AIR

In the foreground is the dome of the 100-inch Hooker telescope, the largest reflecting telescope in the world

THE LAND of the

by Wallace Hutchinson

U. S. Forest Service



THE FOREST RANGER

The watch-dog of an invaluable, gigantic treasury has he become

H. ARMSTRONG ROBERTS

CALIFORNIA—land of romance and adventure—has ever held an invitation and a challenge to the explorer and the pioneer. The attraction that this Pacific hinterland has always had is reflected in the name itself, which probably originated from the legend of Montalvo, who centuries ago wrote of the "romantic wonders and magazines of wealth of the island of California which lies at the right hand of the Indies".

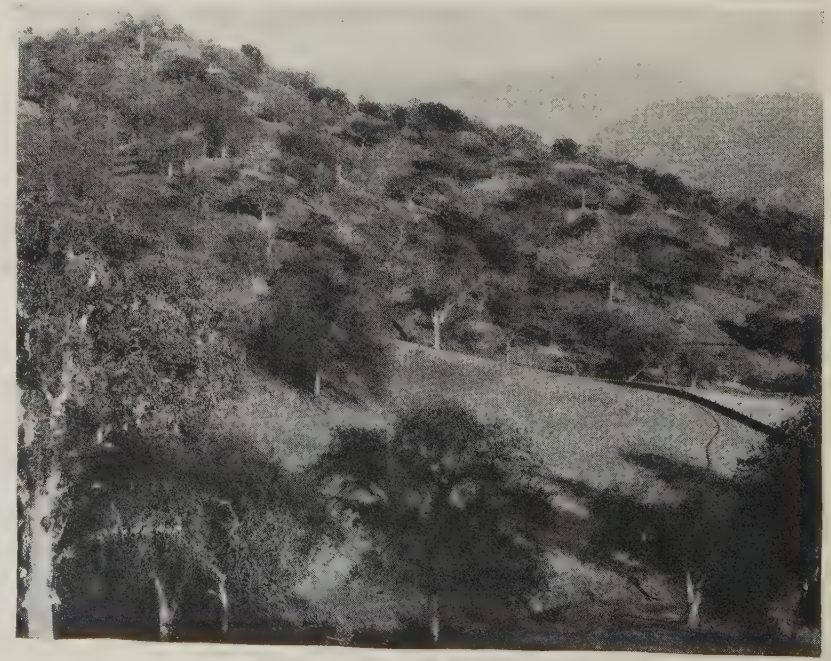
Yet California is a young country, compared with many other parts of America. Though Alarcon in 1540 found the Colorado, and Cabrillo in 1542 landed at San Diego, for a century and a half after the Pilgrims landed on the Atlantic Coast it lay untouched by civilized man. Its real history began in 1769, when Junipero Serra, a Franciscan monk, landed in San Diego, claimed all of California,—still believed by some to be an island,—for Charles III of Spain, and began his great labor of establishing missions along the coast.

The Spanish explorers who were attracted to California in the early days were right in their assumption that the region possessed wealth beyond the dreams of avarice. But they missed the gold they sought,—that lay in the ancient gravels of the foothill streams or was folded into the quartz ledges of the mountains,—and they failed to realize the wealth of her forests and waters, wealth that is now being derived from a thriving timber industry and from prosperous irrigated farms and spreading orchards.

In 1848, after the war with Mexico, California was surrendered to the United States. Then followed pell-mell the news of Marshall's discovery of gold and the steady trickle of immigrants who had come over the Sierra since 1841 turned to a veritable flood. The Argonauts poured into California by land and sea. San Francisco became a seaport. The pastoral era was ended and development began.

Nature in her beneficence has given to California a wealth of forests that is known throughout the world. Here are found the great pineries of the Sierra Nevada, rich in such tree species as western yellow pine, sugar pine, white fir, Douglas fir and incense cedar. Here, too, is found the king of all forest trees, the sequoia,—the largest and oldest of all living things.

In general, the forests of the state follow the mountain ranges which surround the great central valleys



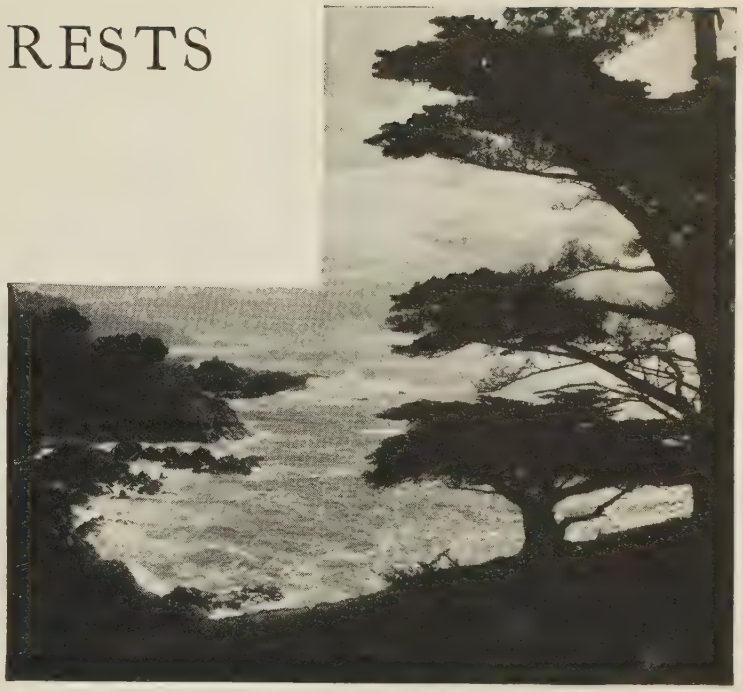
AN OAK FOREST

Nature has made an orderly orchard of these trees on many California foothills

U. S. FOREST SERVICE

Ancient Forests

Where Trees are Worth More Than the Gold



FROM THE WATERS
To the highest mountains are the remnants of ancient mighty forests

I. P. GRAHAM

in the form of a roughly shaped horseshoe. The toe of this shoe is at Mount Shasta near the Oregon line, with the east side extending down the Sierra Nevada to the desert southeast of Bakersfield, and the west side down the Coast Range to a point south of Monterey. Portions of the mountain regions of southern California also contain at high elevations irregular and scattering tree growth, but the bulk of the land that bears commercial forests lies in central and northern California.

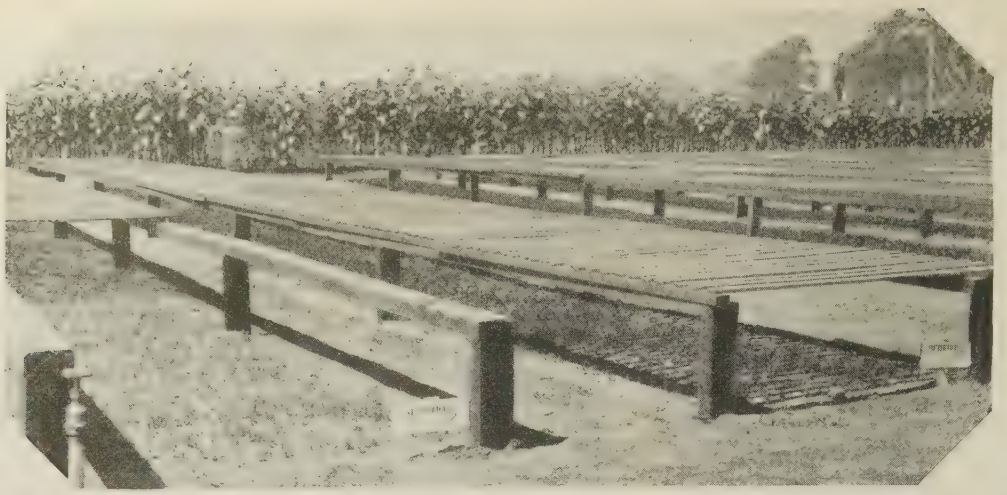
Leaving the lowlands and starting up toward the mountains, one first enters the foothill region, extending from one thousand to two thousand five hundred feet above sea level, and bordering the extensive valleys. There the oaks, which add so much to the beauty of the California landscape, are the most important trees. The scattered forests of this belt are useful for fuel but are not well suited for lumber. Above the foothill zone, at an elevation of two thousand five hundred to seven thousand feet and higher, are the splendid coniferous forests of pine and fir which supply a large part of the lumber that is produced in the state. Beyond lie timber line and the jagged peaks and everlasting snowbanks of the High Sierra.

Millions of years ago, the sequoia, now found almost exclusively in California, was one of the chief garments of the earth's vegetation, forming the most imposing forests the world has ever known. Fossil remains of this remarkable tree have been found from California to Greenland and France to Spitzbergen, offering positive proof that the sequoia was a great genus covering the entire northern temperate zone and extending far into the Arctic region.

Two species of sequoia are found in California,—redwood, which occurs in a narrow belt at low elevations between the Coast Range and the ocean from the southern boundary of Monterey County to the northern line of the state, and the giant sequoia or bigtree, which is found in groups at high elevations through the Sierra Nevada from Tulare to Placer County. Each year a large amount of redwood lumber is being cut from private lands in the coast region north of San Francisco, but no bigtrees are being logged either on Government or private land in the Sierra, and it is doubtful if the people of California will permit the destruction of these last remaining giant sequoias, which have earned world fame.

A CHAPARRAL COAT
Valuable to the hillsides of southern California because it protects watersheds

U. S. FOREST SERVICE



YOUNG REDWOODS

These youngsters starting life in a nursery and hoping to replace their great ancestors in logging areas

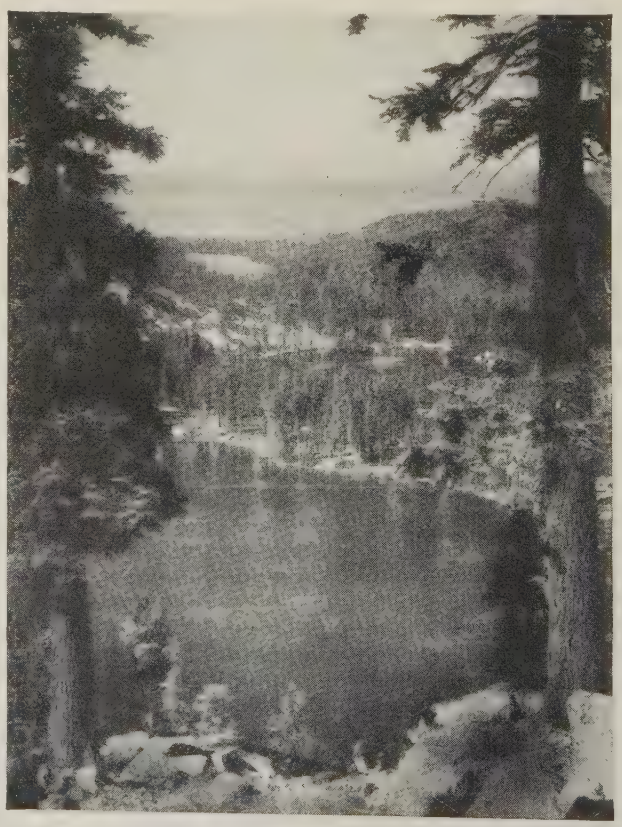
Thousands of acres of redwoods and bigtrees are today preserved in federal and state parks and forests for the enjoyment of future generations. It is known that the giant sequoia lives to be over three thousand years old. The redwood, while not as large in diameter as the bigtree, surpasses it in height, often reaching the maximum of three hundred and fifty feet.

In the mountain regions of southern California are large areas of chaparral or "brush forests", valuable principally for watershed protection and for recreation, with open stands of pine, spruce, fir and cedar at the higher elevations.

The total potential forest area of California is about 19,250,000 acres, or nearly one-fifth of the land area of the state. Of this total, fifteen million acres are virgin timberland, and four million acres are cut-over and burned land. In many of the places where this waste land is protected from fire there is a new crop of trees growing, but where fire is allowed to run year after year nothing but brush is produced. Sixty per cent of the total forest land area is under federal control in the eighteen National Forests and four National Parks of the state. The remainder, which includes a large part of the best and most accessible commercial timber, is in private ownership.

It is estimated that there is enough timber in the forests of California to build forty million five-room bungalows, which would provide shelter for nearly twice as many people as live in the continental United States, or would furnish all the wood for building and for fuel that this country would need for nearly eight years.

In Spanish-Mexican days California builded almost entirely of adobe. Sutter's sawmill in Eldorado County, where Marshall discovered gold, was probably the first timber operation in the State. But with the growth of placer mining came a demand for timber for flumes and dams for storage water, to operate the monitors and sluice boxes, and quartz mining required timber to line the shafts and tunnels. Gradually the cutting of timber spread along the lower and more accessible foothill forests, later to extend far up the slopes of the Sierra. As the cities along the coast grew, the redwoods of the Santa Cruz region and the forests bordering the Pacific to the north of San Francisco were logged. Southern California first drew its timber supply from the pine forests of the San Bernardino mountains.



WHERE GREAT FIRS GROW

Lake Tahoe, around which tower red fir crests. Many similar beauty spots have been destroyed by logging

Today, the timber cut from California's forests each year amounts to over two billion board feet. Only four states produce more lumber than California; namely,—in order of amount cut,—Washington, Oregon, Mississippi and Louisiana. Lumbering ranks fourth among the great industries of the State, employs nearly twenty-six thousand five hundred people, and the annual value of the products cut from the forests is over seventy-two million, eight hundred thousand dollars.

One of the remarkable features of the situation, however, is the extraordi-

(Cont. on page 270)

COURTESY OF MACMILLAN CO. AND PRINCETON UNIVERSITY

A TAR POOL IN PLEISTOCENE TIMES

Giant wolf and Saber-tooth fought for the flesh of the victim and were themselves engulfed

California's Mammals—Past & Present

by Edward A. Preble

U. S. Biological Survey

THE life of any area bears a close relation to its climate and topography. From the burning sands of Death Valley, two hundred and seventy-six feet below sea level, to the alpine summit of Mount Whitney is nearly fifteen thousand feet, the greatest altitudinal range in the United States. From north to south California extends more than 700 miles. There is also very great diversity in the amount of humidity. It is not surprising, therefore, that the mammalian life exhibits a variety greater than is found in any other of our states. Including the relatively small number that are inhabitants of the bordering ocean, more than three hundred forms are now known to live within its borders.

VERNON BAILEY

BIG-EARED DESERT FOX

Ages of listening for the tiny footfalls of mice have helped to develop its hearing

But California has not always possessed the same characteristics that it now shows. Millions of years ago, during Miocene and Pliocene times, there lived a considerable variety of mammals—seals, sea-lions, ground sloths, and many others more or less directly ancestral to creatures now living, though associated with many types now long extinct. In Pleistocene times, the different periods of which enjoyed a great diversity of climate, some of these earlier types still persisted, and with them lived many species which have survived, unchanged, to the present day. Some were wide-ranging in southern North America.

F. K. VREELAND

GRIZZLY BEAR IN THE WILD

This picture was taken, however, in northwestern Wyoming and it is doubtful whether a single wild grizzly now exists in California, a fact deplored by thousands of Nature lovers

Their bones have been preserved in a variety of ways—by being buried in showers of volcanic ash; by submergence in water-borne sands; by deposition in caves or fissures. These are the most common methods of preservation but another is best exemplified in the famous fossil deposits at Los Angeles, known as Rancho La Brea. Here occurred great quantities of bones imbedded in pools of tar or asphaltum, the residue of oil that has been forced up from the formations beneath. For ages this oil has oozed to the surface, and by the evaporation of the more volatile portions has left deep deposits of tar-impregnated earth. In certain pockets or pits this viscid substance occurred in such condition and quantity that veritable traps resulted, where the bones of the victims were preserved by the action of the substance that engulfed them. Here, through the accumulations of ages, an almost incredible quantity of remains were collected.

Deposits of the viscid tar sometimes look like water, or may be covered with wind or water-borne earth that gives to the surface the appearance of solid ground. An animal, perhaps in search of water, would suddenly find its feet entangled in the treacherous mass. Its struggles would cause it to be more firmly entrapped and it would soon become helpless. Its cries and struggles or the odor of its decaying body attracted the attention of enemies that in turn became victims. With the disappearance of the flesh the bones sunk, and as time went on resulted in a great accumulation. Thus a depression containing only a few cubic yards might hold the remains of dozens of large animals, drawn into a common grave.

The presence of large dead animals in the days of their greater abundance attracted also many predaceous birds,—eagles, buzzards, and hawks. A condor, *Teratornis merriami,* was at least one-third larger than our present-day Californian condor, the largest existing bird of flight.

Of the mammals whose bones were preserved in this deposit only the more remarkable can be considered. A giant ground sloth, *Mylodon harlani,* belonging to a group mainly found in South America, and long extinct, was numerous. Its nearest existing relatives, and these very distant ones, are the small tree sloths now living in Central and South America. Camels, a large bison, *Bison antiquus,* the mastodon, *Mastodon americanus,* and the imperial elephant or mammoth, *Elephas imperator,* were also among the herbivores whose bodies are believed to have formed the bait that attracted the carnivores in such numbers. A giant wolf, *Canis dirus,* larger than any now living, occurred in some numbers, along with huge bears, true lions, and also mountain lions, *Felis oregonensis,* and foxes and wildcats not different from the species now existing in the region. But the most spectacular of the carnivores was perhaps the sabre-tooth, *Smilodon californicus.* This has been called a tiger but the name should be avoided since this suggests an animal like our modern tiger, while the sabre-tooth was differently proportioned and its color is unknown. In the sabre-tooth the upper canines were developed to an extraordinary degree, and evidently were the weapons that enabled these powerful cats to vanquish the great elephants and sloths that seem to have been their natural prey. These sabre-tooths, and the other large cats here associated, represented the latest development of a long line of large catlike animals that may have been immigrants, or may have developed here from indigenous ancestors.

W. S. BERRIDGE

YOUNG MOUNTAIN LION

Most primitive cats are supposed to have borne spots, and these persist in young of many species

But our present day animals, though perhaps less appealing to the imagination, call for some attention. Among pelagic species the blue whale, still taken in numbers along the coast, is the largest mammal now living. In addition more than a dozen other whales and porpoises may be credited to the list. Sea-lions

of two species breed on the wave-lashed rocks, and in winter the famous fur-seal, which breeds only on the Pribilofs in Bering Sea, appears offshore, reaching here the most southern point in its remarkable migration.

The largest land carnivore, the California grizzly bear, formerly found over nearly the entire state, has been practically exterminated, and the same fate has actually overtaken a large wolf of unknown race that lived in the Sierra Nevada. A number of carnivores both of the water and the land, descendants or successors of the strange creatures known only from their bones,—sea lions, seals, mountain lions, and others,—we are bent on exterminating because we begrudge them their food. Of the larger herbivores, mountain sheep still exist in small numbers in certain favored localities, and deer, including three species, are well distributed over the state. A small race of the elk, *Cervus nannodes*, is peculiar to the state. Representatives of most of these are at present protected in the parks. Several other carnivores of smaller size,—the red fox, marten, fisher, and wolverene, whose coats are valuable as fur, are very rare here, or almost gone. For a few dollars we seem content to destroy these creatures that are the only remaining links of a long chain. Their danger has been repeatedly pointed out by those entitled to be heard but the appeal is unheeded by the destroyers. Other species, beautiful and of harmless habits, but having the misfortune to be classed as game, may be spared in small numbers in some of the parks.

THE *APLODONTIA* OR MOUNTAIN BEAVER

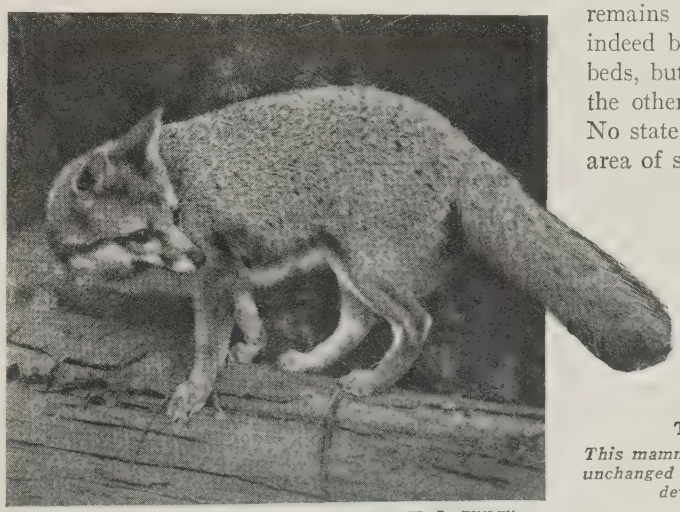
During the millions of years that have elapsed without producing much change in this animal, others have greatly modified in form and characteristics

Needless to say the bulk of California's impressive list of mammals are of small size,—rats, mice, shrews, and bats. Even the deserts teem with these small creatures. If one inspects the sandy floor in the early morning, before the sun has dried the dew and the breezes have swept from sight the tell-tale footprints, he may well marvel at the abundance of rodent life. Pocket-mice, kangaroo rats, grasshopper mice, white-footed mice, and desert wood rats, searching for grasses and seeds during the hours when darkness best shields them from their enemies, now betray to the observant eye the evidence of their wanderings. The desert fox, whose big ears seem to have been developed by ages of listening for the tinkle of tiny feet on the shifting sands, has left his mark also. All these seek their burrows as daylight comes, and in most cases close their doorways. The dense moss-festooned forests of the coast region also have their peculiar shrews and mice, prominent among which are the tree mice, long-tailed species of a group that elsewhere are ground-dwelling creatures of the heathery slopes, but here are climbers, and build huge nests in the lofty evergreens. An animal peculiar to our northwest is the mountain beaver or aplodontia, which has undergone comparatively little change since Miocene times, an interval which has produced profound changes in the members of numerous groups of mammals.

Preëminent among the animals of the darkness are the bats, seeking on velvet wing their insect prey. California's thirty or more species include the mastiff bat, the largest found within the United States, and the so-called western bat, which is the smallest. Among the most remarkable are the long-eared bats whose immense ears give to their owners a most grotesque appearance.

Little seems to be definitely known of the early man in California though a few remains have been found. There seems to be no evidence that he existed here coincidentally with the mammoth and its contemporaries, as was the case in parts of Europe. The remains of a human being have indeed been taken from the tar beds, but his relation in time to the other deposits is uncertain. No state of our union, nor any area of similar size on our continent, has harbored so many tribes of natives as has California. All aboriginal people live close to Nature, and in the

(Cont. on page 275)



W. L. FINLEY

THE GRAY FOX

This mammal has remained practically unchanged through a period that has developed many types

NATURE CLUBS of the GOLDEN STATE

Sierra Club

A pioneer in conservation projects, a leader in Nature education, and an explorer of the Sierra Nevada is the Sierra Club, organized in 1892, with John Muir as president, and now numbering over two thousand five hundred members. It furthered the movements resulting in the establishment of Yosemite and Sequoia National Parks; it has fought encroachment on park lands; it has explored, mapped, and made trails; it has conducted outings into all parts of the Sierra. The John Muir Trail, which follows the Sierra crest from Yosemite to Mt. Whitney, is its pet achievement, almost completed. It issues an annual publication, the *Sierra Club Bulletin*. At present, it is working hand in hand with the American Nature Association to bring about the elimination of patented lands from Yosemite National Park, and seeking to enlarge Sequoia.

Agassiz Club

The Agassiz Club of Long Beach, California, was organized in 1924 to arouse public interest in the protection of unusual types of sea-plants and animals found on the shore from waste crude oil and dredging operations. It conducts field trips and collection trips, and each year makes several journeys to the desert to procure material for a wild flower show which it holds in addition to other exhibits. Led by L. W. Welch, supervisor of natural sciences in Long Beach schools, and Miss Julia Ellen Rogers, it has grown to a membership of more than one hundred.

The Nature Study Club

Busy with bird and flower study trips, hiking, horse-back, motor and sailing excursions from one end of the year to the other, the members of the Nature Study Club of Santa Barbara have become familiar with all the important sections of their state and those adjoining. Santa Cruz Island, in the channel, has been a favorite destination of these hiker-Nature lovers. The club has now busied itself with an offspring, the Little Gardens Club, and has helped inaugurate the well-known Santa Barbara garden tours. Courses of illustrated lectures provide for the bad weather. The officers are H. Howard Pepper, president; Charles M. Glover, vice-president; Miss M. M. Crafts, secretary, and Miss Eva S. Terpening, secretary of the Little Garden Club.

To Study Fungi

For those with special interests has been developed the California Mycological Society, centrally located at Berkeley, the purpose of which is to collect, study and classify species of fungi existing in the Golden State. In the interests of science, members are asked to forward five or more species each year, with notes. It has branches and advisers in different parts of the state; Miss Alice Eastwood is at the Academy of Sciences; D . O. A. Plunkett at Southern; while Dr. W. A. Setchell and Dr. Lee Bonar are both at Berkeley. Miss Elizabeth E. Morse is secretary.

Los Angeles Club

"To study the bird, animal and plant life, and other phases of Nature; to foster a greater love and appreciation of the beauties of Nature; to understand the economic value of natural resources and assist in their conservation"—these are the objects kept before the four hundred members of the Nature Club of Southern California, one of the most energetic Nature organizations in the West. Since its beginning five years ago it has conducted, with the aid of foresters, naturalists, scientists and teachers of the vicinity, weekly lectures and at least two field trips a month. Long journeys to the mountains or the deserts are made a part of the yearly schedule, and large groups of the members take part in the trek. Conservation projects are fostered. Alfred Cookman is now president for the sixth time, and Dr. John A. Comstock, Elbert Benjamine and Dr. Mars F. Baumgardt are vice-presidents. Julia O. Covalt is treasurer, and Dora A. Dayton, at 3915 Walton Avenue, the executive secretary in whose charge is the pleasant task of urging visitors to Los Angeles to partake of the program the club offers.

California Audubon Society

The battle which has been fought in California to save the birds has been conducted mainly by the California Audubon Society and its helpers, and it has been going on since 1906, when the society was organized by W. Scott Way. In 1909 the model law giving protection to all non-game birds except eight was passed, and from then to now the contest has waged over what birds should be blacklisted. The society among other projects has distributed sets of leaflets of western birds to children, and enrolled large numbers of them. The latest activity has been the sponsoring of a State Bird Contest, which will end with 1928. David Starr Jordan was a former president, following Mr. Way, and Wilfred Smith succeeded him. Mrs. Harriet Williams Myers, the present president, has been in office since 1924.

The Lorquin Society

The Lorquin Entomological Society of Los Angeles brings together the butterfly lovers of the region in one of the largest and most active groups of its kind. It has existed since 1916, conducting monthly lectures and yearly exhibits, and in March held the Seventh Annual Butterfly Show, which exhibited nearly fifteen thousand butterflies to seventy-five thousand people. Dr. John A. Comstock is president.

Saving the Redwoods

Ten years ago, in 1918, a writer in a well known weekly called attention to "The Last Stand of the Giants" in Humboldt and Del Norte Counties, California, where not a single redwood tree was owned by the state. Today, along more than fifteen miles of the Redwood Highway—the Avenue of the Giants—nearly a million dollars' worth of primeval redwood forest, worth many times that sum in beauty and majesty, has been secured in state parks for future generations. The people of America, who have contributed generously to preserve these forest monarchs, deserve great credit, but to the Save-The-Redwoods League belongs the honor of leadership and intelligent work which brought such important results. The League is not resting on its laurels, however—it has more tasks to perform. It is seeking to preserve the great 15,000 acre forest in the Bull Creek-Dyerville Park Area, 250 miles north of San Francisco, as an outstanding redwood reservation of national significance, and has been forced to pin its hopes of success on the passage of the state park bond issue, to be voted on by citizens of California in November. Three other projects now being advanced by this energetic organization are the preservation of Prairie Creek Park, 350 miles north of San Francisco, which has an area of 2500 acres; the completion of Del Norte Coast Park, in which only 700 of the 2700 acres have been secured, and the establishment of the Mill Creek-Smith River Park, whose area is 3900 acres. Several years are granted for the acquisition of these areas, as they are not yet directly in the path of advancing lumbering operations. The Save-The-Redwoods League also was a leader in securing legislation for the inauguration of a comprehensive park system in California which will protect the finest of the state's natural attractions from commercial exploitation. The present officers are John C. Merriam, president; Joseph D. Grant, chairman, board of directors; Robert G. Sproul, Treasurer, and Newton B. Drury, secretary. More than 7000 members have been enrolled. The offices are at 220 California Hall, University of California, Berkeley.

To Protect Snakes

In order to secure for the harmless reptiles the protection which is given to some of the birds, mammals and fish, G. Edward Roehrig, M. D., started in 1926 the Herpetological Society of California, whose purpose has been to educate the picnicker, hiker, farmer, tourist and camper as to the economic value of some snakes and the innocuousness of others. Two field trips are arranged annually for the purpose of collecting and observing reptiles in their native habitat, and signs have been placed in different parts of California to inform the ignorant that the only dangerous reptile indigenous to the Golden State is the rattlesnake. The society also plans to work largely on reptile range extensions, a scientific field hardly touched. A committee on taxonomy keeps records of specimens caught, to accumulate data on local reptile life. The present officers are: G. Edward Roehrig, president; Howard R. Hill and Alfred Cookman, vice-presidents; Albert E. Colburn, treasurer, and Charles M. Bogert, corresponding secretary.

(Continued from page 220)

sides causing serious damage to crops. Even more striking in its effects is a hot wind of the southern part of the state, known as the "desert wind" or "Santa Ana". Apparently this wind consists of air that is hot and dry to begin with and becomes a great deal hotter and drier, besides acquiring hurricane violence, in descending a mountain slope, thus belonging to the cosmopolitan family of winds called "foehns". The blast is sometimes strong enough to uproot trees, unroof houses and pierce window panes with the fine gravel it carries, while crops wither before its scorching breath.

California is one of the few states of the Union in which tornadoes are practically unknown. Formerly the lowlands of the state, and especially the coast, enjoyed the undeserved reputation of being exempt from damage by lightning. Visitations of this character are not frequent, but they do occur, and it is pertinent to mention that Californians, who like to do things on a big scale, have lately erected the largest lightning-rods in the world to protect their enormous oil-storage reservoirs, which in April, 1926 suffered losses from lightning fires to the extent of $20,000,000. On the forested mountain slopes destructive lightning is common, and more than forty per cent of all the forest fires in the state are due to this cause. Writing of California's "big trees", John Muir once declared that all the very old specimens have lost their heads by lightning.

California suffers grievously from two climatic scourges—drought and frost. With respect to both the people of the state have risen energetically to the occasion. As an offset to the former, gigantic water-storage and irrigation systems have been erected. Great aqueducts carry water 189 miles to San Francisco and 259 miles to Los Angeles. The hydro-electric industry, in an effort to ensure continuous operation, has refashioned the geography of the wilderness by marvelous feats of engineering. A single company now has construction work under way that, when complete, will have cost more than the Panama Canal.

California citrus-growers have found a twofold cure for frost in the orchard-heater and the meteorological expert. More heaters are in use in the groves of this state than in the rest of the world combined. Meteorology, as represented by Weather Bureau specialists, provides an intensive system of frost forecasts without which orchard-heating would be both wasteful and ineffective.

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The American Tree Association stands for a constructive policy of forest protection and extension, to increase appreciation of forests as natural resources essential to the sound economic future of the country.

The Association directs encouragement of tree planting by the public; disseminates popular forestry news for the information of editors of the daily press; and compiles and distributes forestry news and reports on legislative progress for assistance of active foresters in the field.

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Educational Director

California is one of the leading states in forestry education in the public schools. The American Tree Association has given 160,000 Forestry Primers to the Boy Scouts and the schools of the state. These are being used in project work of various kinds. In tree planting, too, the schools are pointing the juvenile mind toward the forestry problem as set forth in the Forestry Primer. Take the case of the Los Angeles schools. Tree planting on barren school grounds has developed into a part of the city school program. As a result the pupils are learning the value of forests and to recognize the trees of Southern California. They study the kinds of trees that will flourish in a soil where other kinds would die and to know their habits and the length of life to be expected from the various kinds. When Frank A. Bouelle, assistant Superintendent of Schools, undertook the tree-planting program he gathered this committee: Clayton F. Palmer, Supervisor of Agriculture, and C. L. Glenn, Supervisor of Physical Education, and J. B. Corcoran, W. R. Tanner, Marie A. Larkey, Lee Roy Smith, F. M. Fultz, Vernon Morris and Roland C. Ross, members of the agricultural, the landscape, or the forestry divisions of the schools. Mr. Bouelle and his committee promoted the planting of 7,388 young trees and nearly all of them came from school gardens. They were seedlings that the children in the elementary schools had tended and watched through several years and when they were set out on the school grounds the interest of the young gardeners followed them. The children helped in the work. Their interest was so keen that school executives saw a means of teaching forest conservation and an educational program was developed. Blue-prints showing the shapes of twenty familiar trees were distributed. Other blue-prints of the leaves of some forty trees were studied. Children took sprays of leaves to school. They made lists of the trees they passed. They were able to describe the appearance of the different trees, the type of bark of each and to know them as they knew the faces of their friends. As the work went on the children talked about the trees at home. As a result of the tree planting program forestry education is to be continued.

With 10,000 trees for a starter, foresting the new University of California campus at Westwood Hills was inaugurated. The trees are a portion of the 80,000 specimens which were propagated at the university nursery, in operation the past two years. George C. Groenewegen, propagator to the university, now has more than 11,000 pine trees in various stages of growth, in addition to the scores of other types of trees, shrubs and flowers particularly of Mediterranean nativity which are to follow the first unit of 10,000 trees.

In honor of John McLaren, superintendent of Golden State Park, who was the guest of honor, several thousand trees were planted in McLaren Park. The McLaren tree-planting day was a memorable one in the lives of the children of San Francisco, all of whom know "Uncle John" McLaren.

The first year's program of the chamber of commerce of Kingsburg, Calif., in planting trees within the city and along the several highways has been completed. This year's work is the first part of a five-year program to beautify the city and its approaches.

The state is making great strides in roadside beautification and in many places county units are doing the work that connects up with neighboring counties. In this work women's clubs and business organizations are doing a great work in tree planting. The way the community spirit takes hold of such a program and puts it across is shown in the planting of eighteen miles of highway by citizens of Delhi, Turlock and Livingston. A permanent organization has been formed to continue the work. More than 500 people inaugurated the program. At the Delhi Community Clubhouse, members of the American Legion planted a cedar in memory of their comrades. In this fine program of roadside planting the people of Merced and Stanislaus counties are doing a fine thing for their children, their grand-children and California. In the planting, Lombardy poplar, European sycamore and black locust were used.

Another fine example of tree planting is that in Tulare County from Goshen County to the Kings County line along the Sierra-to-the-Sea Highway. W. E. Glendenning of the highway commission aided the program.

More than 68,600 trees and shrubs have been planted along the winding drives of Girard since the founding of the west San Fernando valley community five years ago.

To further the progress of forestry in California, Gov. C. C. Young has appointed to the State Board of Forestry the following: Geo. C. Pardee of Oakland; Maj. Swift Berry of El Camino, a director of the California Forest Protective Association; A. J. Mathews of Susanville; W. O. Blasingame of Fresno, Vice-President of the California Cattlemen's Association; H. S. Gilman, Los Angeles Forest Protective Association; D. Eyman Huff of Orange; Walter Mulford, professor of forestry, University of California.

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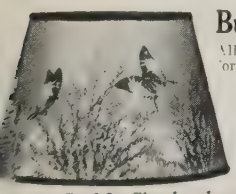

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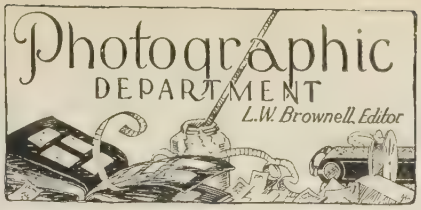


How can one best obtain good photographs of distant landscapes?—C. L. B.

In photographing a landscape that is more or less close to us we must, necessarily, expose for that part of it that is nearest to us in order to obtain full detail in the foreground but in making a photograph of a more distant landscape, such as a view that is half a mile or more from the camera, we must expose for the most distant point, which means that the length of exposure must be very much shorter than in the former instance.

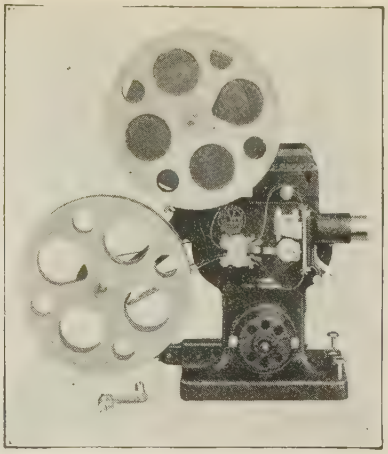
The greatest problem to solve in this work is to secure the necessary amount of contrast between that part of the landscape that is farthest away and the sky. Unless special care is taken in many cases the sky-line is almost, if not completely lost. This is caused by the bluish haze that is almost always to be found over a distant landscape even on a perfectly clear day. Of course this haze is also between the camera and nearby objects also, but in such a negligible quantity as not to be noticed; but as the distance increases this haze becomes more and more noticeable until it will, sometimes, almost obliterate the sky-line to the naked eye as well as to the lens of our camera.

This haze, when it is not too dense, may be overcome by the use of the light yellow color screen which absorbs the bluish rays emanating from this haze and does not allow them to reach the plate. Still more contrast can be obtained, of course, by the use of the Wratten K2 filter which is a deeper yellow and, therefore, absorbs more of the blue rays. We must also bear in mind, in this class of work, that an overexposed negative destroys contrast in proportion to the amount of overexposure. We must, therefore, be extremely careful to give as nearly as possible the correct exposures in order to obtain the best results.

For very special work on the most distant scenes when the greatest contrast possible to obtain is desired or when photographing snow-covered mountains, or plains, against a bright blue sky the Wratten G filter with the panchromatic plate will be found to give the very best results if used correctly.

It is extremely difficult to give hard and fast rules for the amount of exposure necessary, as light conditions are rarely the same and there are other factors that are frequently to be considered. Under ordinary conditions, however, with the lens stopped down to f32. and no filter, an exposure of 1/25 of a second should be sufficient. When using the light yellow screen at the same stop an exposure of approximately 1/5 of a second should give a correctly exposed negative, while with the Wratten G filter the exposure must be increased to at least two seconds under the same conditions.

Of course, with this type of landscape photography, it is absolutely necessary, if one would obtain the fullest amount of contrast in his pictures, that the negatives be fully developed. In fact, a little judicious overdevelopment, so long as chemical fog does not occur, does no harm but often improves the negative.



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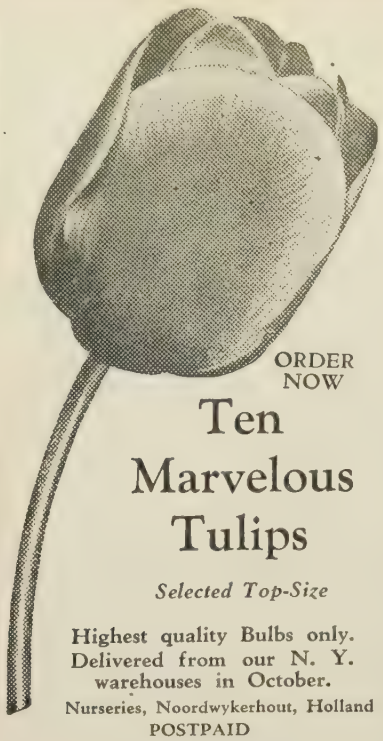

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with their tall (6-8 ft.) stately spikes of blue flowers, are the finest blue perennial in existence. Fine for background, in groups or as single specimens. I grow the famous Wrexham and Vanderbilt strains which come in various shades of blue, many having beautiful pink and lavender shadings. Also Toole's white, which is as good as the others, and pure white. There is nothing better to be had than these strains.

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CHAMPLAIN VIEW GARDENS Box D-2, Burlington, Vt.

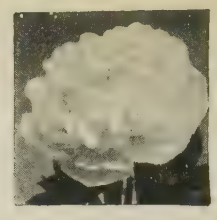
(Continued from page 223)

a mop of purplish-bracted flowers, the whole suggesting a tiny brush held up by its handle. We may, if we like, call it escobita, which means little broom, and is the name the Spanish Californian children have taught us. Like its relatives, the scarlet castillejas or paint-brushes, it flourishes alike by the sea, in inland valleys and well up the mountain sides.

As May wanes and the ground becomes baked and dusty in the lowlands, hillsides here and there are ruddy with the charming flowers of the clarkias, namesakes of that doughty pioneer, Captain William Clark of the famous Lewis and Clark fellowship. Godetias expand their satiny petals in pink, mauve and crimson, infallible heralds of summer—a fact that inspired some one long ago to christen this popular favorite Farewell-to-spring, a name which still sticks in the speech of the children. This, too, is the season when the stately spires of the Spanish bayonet, *Yucca whipplei,* crowd the foothill slopes and crowd sandy arroyos in the southern half of the State. The huge white panicles are as much as a yard high, crowning a slender stalk as long or longer, and are of pure and ethereal beauty, able, you would think, to touch the most callous heart. At any rate, they have sufficiently impressed the law makers of some counties in the State to make the mutilation of the plant or the gathering of its flowers on public land a punishable offense. On private land the permission of the owner must first be gained.

The last days of spring bring two other remarkable plants conspicuously into bloom. One, the famous Matilija poppy with white, crêpe-like flowers, golden centered and sometimes five inches across, is restricted to rather out-of-the-way places at the southern end of the state. The other is the less generally known *Fremontia californica,* a shrub or small tree indigenous to dry foothills in central California as well as to the lower slopes of the San Gabriel and San Bernardino mountains facing the desert, where it occupies considerable areas. The flowers, each the size of a twenty dollar gold piece or larger, are borne in greatest profusion, and at the height of their blooming make an unforgettable sight, the entire plant being transformed into a shining tent of golden yellow. The renowned "Pathfinder", whose name it bears, can hardly be forgotten while this noble flower endures.

Midyear, marked in the parched valleys of the low country by the monotonous



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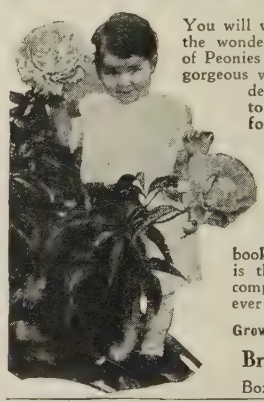

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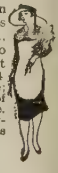

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Those who have enjoyed the lovely color pictures of the flowers of the Far West which have appeared from time to time in *Nature Magazine* and especially in the July number, and those others who have reveled in the beauty of the Western Flower Series in color in the National Geographic Magazine for May, 1927, will be pleased to know that many of the bulbs and plants therein described can be had in fine quality from a nursery which has specialized in that very thing for fifty years.

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Starting Young!

Here are the Zandbergen Brothers visiting this Spring's tulip show. Though still quite young they show interest in the flowers. The variety shown in the foreground above is **Baronne de la Tonnaye.** Flowers are of great substance and last a long time. Of bright rose, margin blushed rose. One of the finest varieties for border planting. Height 30 inches. **60c per dozen, $4.00 per 100.** Hundreds of equally beautiful varieties of Tulips and other Spring flowers are offered in *Free Catalog.*

ZANDBERGEN BROS., *"Tulipdom"*

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gold of tarweeds and sunflowers, carries spring into the higher altitudes. From the Oregon line to Lower California, the eagerly sought snow-plant pushes up its crimson bulk from the ground litter of the upper pine belt. In some localities it is abundant, in others rare; but in any case you had best let it live ungathered, for it is one of the native plants under the law's protection in some sections of the state, and its possession might prove costly. In coniferous forests also the Washington lily is to be looked for. Its slender bells, white aging to rose and distilling the fragrance of pinks, are among Yosemite's loveliest and rarest midsummer blossoms. No less exquisite but in lemon yellow, purple dotted, are the Parry lilies of the southern mountains—*Lilium parryi,* whose name commemorates one of the kindliest and most lovable characters among the naturalists whose labors a generation ago brought to light so many of the floral treasures of our western coast, —the late Dr. C. C. Parry. Also in the open pine woods of summer you will come upon those dainty globe- and star-tulips, *Calochortus* sp., that are popularly known as fairy lanterns, pussy ears and what not. The borders of mountain streams and boggy meadows are the haunt of a host of flowers—fragrant azalea and calycanthus, Nuttall's dogwood, the scarlet mimulus, wild iris and blue camas, the strange California pitcher-plant or *Darlingtonia,* and the regal cone-flower.

Dry places, too, have their flowers, often with sweet-smelling foliage, as certain artemisias and various members of the mint sisterhood, including the many deliciously scented monardellas. Indeed, wherever you go among the California mountains in summer, you will be among flowers, ever choicer the higher you climb. When every night is freezing you will still find bryanthus warming with crimson bloom the stark granite about timber line, and dwarf gentians, blue and white, starring the turf beside glacial lakes. And on such frosty summits John Muir's favorite flower, "lowly, hardy, adventurous cassiope", droops her modest bells, and California's sole primula, the red sierra primrose, nestles among the splintered crags.

Into Death Valley

(Continued from page 230)

After dinner we set forth again, all four in one car, slipping down onto the floor of Death Valley between the stately snow-clad Panamints and the crazy-colored Black Mountains, which today seemed to specialize in "passionate pinks", greens, yellows, and orchid hues. In about half an hour the road entered the salt beds, facetiously named "The Devil's Golf Course". Imagine an ice jam on some swollen creek in spring, only with separate blocks no larger than a foot across and all pitted and pointed like the stalactites of a cave; powder the whole with sand and clay, and you have a rather unsatisfactory picture of the Devil's nine holes on this course—two miles each way. There are wheel tracks across this bed of solid salt, the space between the whole supposedly levelled by the removal of the most offending blocks. The motto of this road is taken from Verdun and reads, "They shall not pass—another car". The virtue, however, lies in the fact that there isn't any other car to pass.

The moon rose as we ate our supper, and outside on the built-up terrace Bill Sullivan waited with the horses. How eager they were as we mounted in the cool of the evening and jogged briskly down again to the valley floor for a gallop in the moonlight. On the gravel road sparks flew, but as we turned out across the soft powdered clay the noise of hoofs was muffled, the swaying of saddles smoothed to feathered ease. So, on horseback, had travelled the pioneers—that is, before their stock perished of starvation and many of them also died. And always the silence. When we slowed to a walk even the creaking of saddle leather was hushed, and we were alone in the vastness of the desert. Not even the cry of a coyote broke the stillness; and the shadowy mountains on either side seemed remote and aloof.

Contrast the plight of those early emigrants with ourselves, breakfasting next morning on iced orange juice, coffee, toast, and bacon and eggs, all beautifully served upon the stone terrace outside our bedroom doors. We looked down into Death Valley and up into the cloudless sky where the snow-mantled Panamints barred the western gate. To the Jayhawker party in 1849 those very mountains formed a prison wall. This afternoon we would cross them in a few hours of comfortable driving.

But first we still had much to see. Back up the Furnace Creek wash we sped, re-

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100 Narcissi, U. S. Grown	5	"	8.50

50 Bulbs at the 100 rate.

Extra Special—12 Louis XIV Breeder Tulips, Purple, Gold Margin, $1.10; fifty for $4.00; 100 for $7.75

All varieties grow 2 to 3 feet tall. Giant Bloom.

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100 Valentine	Violet	4.50
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tracing our moonlight route when we first entered the valley. Past Ryan, 3,500 feet above our hotel, on up and up. "Dante's View—5 miles", said the sign. Now we began to climb in earnest, headed for the top of the Black Mountains. High gear failed, then second, and we pulled along in low, bursting at last upon an indescribable panorama of Death Valley. High enough now we were to look across and catch a glimpse of Mount Whitney in the Sierra, viewing at the same time the highest and lowest spots in the United States. Far below us the valley floor seemed a vast white expanse of salt—like a frozen lake of flowing, white lava—the light counterpart of the crater of the volcano Kilauea. "Can you name a single shade or color you can't see somewhere in this panorama"? We could not. They say that one artist has come here for several years to try to paint this view, but always leaves with the feeling that he hasn't grasped it yet.

After replenishing our gasoline supplies at 40 cents a gallon and carefully filling our water bottles, we started on the return trip out of Death Valley. This time our route led northward through the bottom of the valley to Stovepipe Wells on the edge of some gigantic Sahara-like sand dunes, and then due west over the Panamints by way of the historic Townsend Pass.

The road through the valley was fairly rough, but at Stovepipe Wells we passed a toll gate, and the road was worth it. Higher and higher we climbed, looking back at last for a final glimpse of that valley of ever-changing lights, then still higher, hoping that the engines would not overheat in the long struggle. Nearly 6,000 feet above the valley floor we viewed a new panorama of snow-clad peaks, only to drop dizzily into lonely Panamint Valley, empty and silent in the gathering dusk. The bottom of this valley was another alkaline flat, smooth as a boulevard. The great open spaces were certainly wide open here.

Our road now entered a long box-like canyon on the westward side, climbing again more and more steeply, twisting and turning as each successive box seemed to offer no possible outlet, and then finding some gap so narrow as just to permit our automobiles to pass. Two or three wild burros looked up nervously as we approached and then galloped off. Wild burros are not native here, but are simply animals which have strayed off at some time. Again came dusk, weird and mysterious, emphasizing fearfully the awful emptiness of this wild land. Up and up, down and down,—we had never encountered a road more spectacular. It was unfortunate that we could not have made an earlier start so as to see it all by daylight; but the moon, now just rising over the mountains behind us, gave to the whole scene an indescribable aspect of wildness which daylight could not have surpassed. At last we passed a mine with aerial bucketline cutting a strange path across the sky. Then lights loomed suddenly ahead; we were in the little mining hamlet of Darwin at last.

ORDER YOUR EXTRA ISSUES NOW

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Museum Work

(Continued from page 244)

of History, Science and Art has both the largest physical plant and, geographically, covers the widest field. Here may be seen beautifully prepared groups of African game animals as well as exhibits from the Americas and from many other parts of the world.

While all museums recognize the importance of Nature study for children, a feature that is probably stressed more by Californian museums than those of other parts of the country is adult education in the out-of-doors through a system variously known as "Nature walks" or "Nature guide service". The development of this type of work is undoubtedly due to the large number of visitors and tourists, who are ever eager for authoritative information, and also to the large proportion of the population that is retired from active business and has therefore more time for the esthetic and cultural things in life. The favorable climate, too, by which excursions can be successfully conducted in many localities at all seasons of the year, has also had its bearing on the popularity of such trips. In San Diego, so great has been the response to this service that the San Diego Society of Natural History now not only conducts walks on foot, but charters special stages and boats to convey the people to outlying regions of particular natural history interest. The variety of available country in Southern California, with ocean beach, mountain-top, and desert each available within a few miles of the others, provides unusual educational opportunities. In Los Angeles, and in Yosemite and Sequoia National Parks, Nature guide service, while not strictly a museum function, nevertheless is more or less an off-shoot of museum work, and is largely conducted by persons with museum connections.

More Open Spaces

(Continued from page 225)

expression of supernal wisdom is not wholly assumed. I miss the coyote, an untamed, impossible, dejected dog, without a trace of self-consciousness, whose hind legs run faster than his fore legs, thus turning the beast around at intervals, when he sends out an emotional howl which has the merit of seeming to come from a whole pack.

And now about the trout hog! He is always with us. We wouldn't mind the lies he tells of his great catches; we are all prone to this fault, lovable when not too tedious. What we object to in his fables is that they are often founded on facts, as heaps of little withered fishes sometimes testify. The angler goes a-fishing in order to associate with fish—to be out in places where fish live, and no creature lives in choicer surroundings than a trout. Big rivers, little rivers, cataracts or pools, the trout loves clear waters, well aerated, and will have nothing else. Green banks mid shady forests are his home. When these are gone, the trout will still thrive in artificial ponds, fed on chopped liver, to be caught by tourists at a dollar a pound. And the angler will wander far afield to search for the "nameless river", the haunt of the "God of Things that Are".

Field-grown ROSES for Fall Planting

THE man or woman who succeeds best in any undertaking is the one who looks—who prepares ahead, who, in fact, does things in the right way and at the right time.

Peterson Roses have a reputation, approached by no others, for living and thriving when **Fall planted.**

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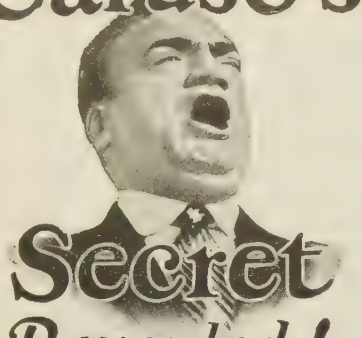
Caruso's



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Land of Ancient Forests

(Continued from page 258)

nary consumption of lumber, which totals approximately three and one-half billion feet per year. California with four million people uses more lumber than New York State with its population of eleven million people, and three times as much per capita as the average consumption for the entire country. This is due in part to the phenomenal growth of California and the large demands for lumber for homes and industrial development as well as for boxes and other wood products used in the preparation and shipment of citrus fruits, grapes, figs, raisins and many other products of orchards and farms.

But in as much as about one-third of the lumber produced each year is shipped out of the state, California, with nearly fourteen per cent of all the remaining virgin timber in the United States within her borders, has to bring in, chiefly from the Pacific Northwest, more than two billion feet of lumber annually to meet her growing needs.

As the private forest holdings of California are depleted the timberlands of the Government—the National Forests—will become of increasing importance, and from these lands will come a large part of the domestic lumber and other woods products required for the continued prosperity of the state. The present stand of timber in the National Forests is estimated at one hundred billion feet, worth $200,000,000 on the stump. The annual cut from these forests is about three hundred million feet, and this cut, under scientific forest management, can in the future be doubled or even trebled and continued for all time without injuring or reducing the forest capital.

In 1927, Governor C. C. Young created a Department of Natural Resources which included under one head all activities in

(Continued on page 271)

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(Continued from page 270)

connection with state forests, parks, mining and fish and game. The Federal Government has also established a California Forest Experiment Station for the scientific study of important forestry problems. The University of California has a Department of Forestry which gives a four year course leading to the degree of Bachelor of Science in forestry.

Forestry in California is no longer a theory only to be studied in books. It is being practiced in a business-like manner on many forest areas throughout the state. Under the leadership of the United States Forest Service, which has laid the foundation of forestry practice in the National Forests for over twenty years, a number of the large lumber companies and forest landowners in the Sierra pine region, who hitherto have given little thought to the production of future timber crops, are now putting into effect principles of forest management and fire prevention with a view to placing their operations on a permanent basis. The redwood lumbermen have embarked on one of the largest reforestation projects in the country, under which more than three million redwood seedlings are planted each year on cut-over lands. Large tree nurseries have been established and within a few years these redwood companies expect to plant, for each acre of mature redwood cut, one acre of redwood seedlings.

Many public service organizations and individuals, all working hand in hand with the federal and state foresters, are rendering valuable cooperation in educational work in forestry and fire prevention and control. Studies are also being made for the purpose of determining the economic value of the forests as related to the state's industries, so that a clear cut forestry policy may be worked out.

But with all the encouraging progress that forestry has made in California, much still remains to be done. Great areas of valuable watershed cover and timberlands are burned over each year by fires, seventy per cent of which are started by human carelessness. There are some one million, five hundred thousand acres of privately owned cut-over land which is producing but a small part of the timber it is capable of growing. To this total must be added the carelessness. There are now one million, fifty thousand acres of forest cut each year by lumbering operations, at least forty per cent of which is left in such a condition that there is little hope for a renewal of forest growth for many years to come.

The solution of California's forestry problem, outside of lands controlled by the Federal and State Governments, rests largely in the hands of the lumbermen and private forest owner. To solve this problem of private forest land use there is needed more effective fire protection, both in virgin timber stands and on cut-over land; artificial planting on a large scale of areas denuded of their forest growth or supporting only a stand of brush; less destructive methods of timber exploitation which will leave sufficient seed trees to restock the land and will also preserve the young growth already on the ground, from which the future forests will come; regulation of the cut so that where possible only the mature timber will be taken, and that at a rate not

(Continued on page 272)

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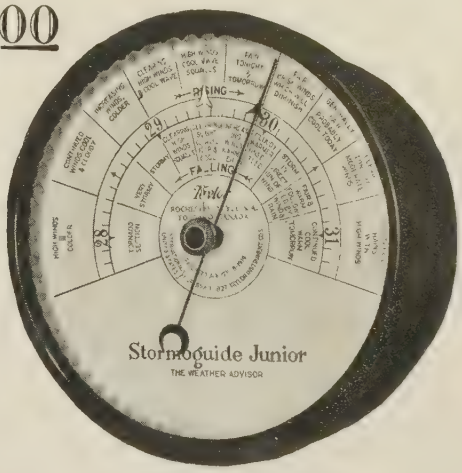

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Rheumatism "Cures," an exposé of quackery, is another important feature in the October HYGEIA. Then there are *Broken Minds of Youth,* written by a noted psychiatrist; *Advice to the Hard of Hearing; The Bowling Green; The Runabout Child; Stuttering;* and many other articles, all cleverly illustrated and entertainingly written.

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(Continued from page 271)

in excess of the annual growth of the forest: forest research to determine the best methods of timber growing and timber utilization, and a more widespread campaign of education in forestry and fire prevention.

California's prosperity has always been inseparably linked with the wealth of resources provided by her forests. It is the duty, therefore, of every citizen to see that these forests, which are of inestimable value to the state and nation, are used wisely and protected from damage and destruction.

California's Trees

(Continued from page 250)

fornia has acquired more than local fame—an avenue in Altadena, nearly a mile long, approaching the snow-crested Sierra Madre. Each Christmas these trees, which were set out over forty years ago to line the entrance to a ranch, are lighted with electric lamps and throughout the holidays draw throngs of visitors from near and far.

A remarkable group of cone-bearers are the Araucarias, native to several parts of the southern hemisphere, where they take a place in the arboreal scheme occupied in the North by the pines. Of the various species grown in California three are especially noticeable—the so-called monkey puzzle from Chile, the bunya-bunya from Australia, and the Norfolk Island pine, word of which Captain Cook brought from the island of that name in the south Pacific. You will be interested to recognize in the last, as it towers skyward forty or fifty feet, a gargantuan version of the potted plant that modestly graced a corner of your flat back East. The monkey puzzle is as queer as its name, with blunt, slender branches close fitted with scale-like leaves, and reaching out waveringly in all directions like so many restless serpents held by the tails. The bunya-bunya, so named by Australian aborigines, is a magnificent tree. Its compact crown rises from the ground to a dome-like summit, which in its native Queensland might be one hundred fifty feet in the air; but it is questionable if any specimen in this country approaches that eminence. The cones of the Araucarias are huge, sometimes the size of a man's head, and on falling often shatter into a hundred pieces as they hit the ground. And here it is apropos to speak of a much-planted tree that every one mistakes for a conifer until taught better,—the Australian beefwood, she-oak or cassowary tree,—*Casuarina* of various species. It is really leafless, but the straight, slender branchlets, jointed like an equisetum or horsetail, are such excellent imitations of pine needles that the layman need feel no disgrace when he mistakes the tree for a pine. Moreover, the tight-fisted little clusters of seed vessels that string the branches are quite like diminutive pine cones. Nevertheless, the *Casuarina* is not even appreciably related to the pines, but is in a family by itself bearing its own name.

A tropical touch is given to much of the California wayside by palms of many kinds. You will soon notice that these aristocrats are of two general types—the leaves of some are like great feathers, of others, like fans. Of the former type are *Cocos plumosa* from Brazil, a slender tree much used where economy of space is a desideratum, the picturesque African *Phoenix reclinata,* and

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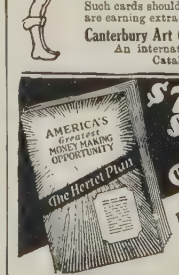

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the rare *Loroma amethystina,* whose clustered flowers in amethyst and old rose are of exquisite beauty. Commonest of this type is the Canary Island date, whose giant fronds cast a shade over thousands of lawns in the state, while in desert valleys of the South commercial groves of the true date palm of history and romance border the highways for miles. Of the fan-leaf type perhaps the surest to awaken interest is the California fan palm, *Washingtonia filifera robusta,* a native variety introduced long ago from the California desert. A noticeable trait, inherited from that old desert home, is the reflexing of the dead leaves against the trunk, where they cling head downward for years if undisturbed, forming a protective thatch that must have been of great service against the dessicating blasts of the region.

That delightful understory which shrubs supply to any planting of trees is marked by the same cosmopolitanism that obtains in the case of the trees. Every part of the globe has been levied on. Here are oleanders, red and white, and golden-flowered brooms from the Mediterranean region; heathers from South Africa, a noticeable feature of winter lawns; ruddy nandina, bearing good fortune in its leaves, from Japan; fragrant buddleias from China, and Andean escallonias. From Australasia comes a notable group, among which are the callistemons or bottle-brushes. Never was flower better named, for the long, bristling stamens, in the form of a perfect cylinder around the branch ends, exactly resemble the kitchen utensil after which the plant is popularly called. A related genus, *Melaleuca,* is also a favorite because of its graceful habit and dainty foliage, enlivened in season with flowers in red, purple or creamy white, some in compact little balls, some in narrow cylinders like smaller bottle-brushes. Then there is the graceful Australian tea-tree, *Leptospermum laevigatum,* whose wandlike branches sparkle enticingly in May with a myriad starry white bloom. This shrub is a famous sand binder, and thousands were used to stay the shifting waste on which Golden Gate Park, San Francisco, was founded. Pittosporums, richly fragrant, are a commonplace. When you see strawberries in green, yellow and deep red, hanging from a bush as high as your head, you are not dreaming, but looking at *Arbutus unedo,* the strawberry-tree of southern Europe and, strange to say, Ireland; and a shrub with leathery leaves of so great glossiness that you might at a pinch use one for a mirror,—that is New Zealand's *Coprosma,* the looking-glass plant.

Parks of the Golden State

(Continued from page 239)

for these trees that should live many years.

Exotic plants and animals have been introduced into some of the localities, with well-known results. The Tennessee opossum has become a competitor and danger to the native species following his escape into Sequoia from other sections of the state. The English sparrow, like the poor, is still with us. European weeds have not only invited themselves to the valley floors, but driven some of the wild flowers out. The ox eye daisy was nipped just in time to

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prevent it from being the entire panorama in Yosemite Valley.

There are worse things, however, than these. One of them, and the hardest to combat, is private ownership on park land. Park regulations here cannot be enforced. Scarring gaps can be left in beauty spots; undesirable subdivisions and commercial projects invade new areas reserved for America's Nature. Congress refuses to purchase private holdings, and while private citizens, including the Director of the National Park Service, have generously purchased smaller tracts and presented them to the government, yet beautiful groves have gone, to make boxes, antiques, fence posts, and doors.

The visitor to the park, however, need not worry about administration, except as he can help by influencing public opinion to arouse itself. His are the parks, to play in, to study. For him is the dignity of the great trees and the shimmering of the lakes embracing the mountains. For him is the wild life and the luxuriant flora. Over all the ranges of the parks,—over Yosemite, Sequoia, Grant or Lassen,—he may have his playground. That is one of America's,—and California's,—gifts to him.

The Sierran Barrier

(Continued from page 252)

The Nevada plains look up for rain and there is none. The desert air quivers with month's-long heat; the dust follows the roving hungry herds; yet the Sierran bulwark is unmoved. Seldom does a summer cloud break over with a load. Rain is for the Pacific side. In winter the orders are less strict and snow falls to cake the dust and start spring grass. This mighty blockade is the curse of the inland west. Yet at its feet are greenness and fertility, for from the steep sides perpetual waters flow and spread out on the level land below. The mad-rushing streams forget their courage at one taste of dry soil and resort to placid aimless wanderings as if drugged with the bitter sage. It is a boon to the horseman and the rancher, for the meadows are well watered and productive. Compared with the smiling vibrant green of mountain meadows aside nervous splashing brooks, these close-fed fields are a sour green to the eye and a yellow mold in the nose; the sluggish brook is senility, prolonged and unburied, so great is the contrast one feels after leaping, chasing and resting beside Sierran torrents and cascades amidst the wild rocks and tender alpine flowers. And just here the one rightful judge and critic of mountain waters offers his favorable and unqualified endorsement that high Sierra streams are best, purest, brightest, surest. On these icy noisy madcap waters, whether in forest levels or above in the windswept barren rocks, there is always to be found the water ouzel, either in bowing, chuckling person or by his signs upon mid-stream rocks. Nowhere have I found more of these dippers and seldom have they been as tame. Ten feet was permitted several times with choice glimpses of underwater wading and hairbreath escapes in rapids. Here is the center water ouzel population in California,—the east streams of the High Sierra. And no wonder: dashing, boiling pell-mell waters are home and happiness to this sturdy little bird and here he finds his Paradise.

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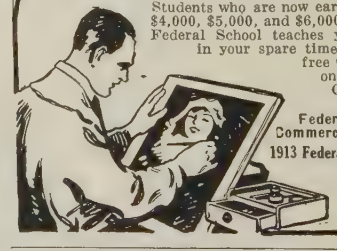

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California's Mammals

(Continued from page 261)

minds of the more intelligent, the wild animals assume very important rôles Thus all of these tribes have folklore tales that explain the origin of many things; of the world itself, of their own people, of the animals and birds, the sun, fire, thunder, and the rainbow. The cougar, the grizzly bear, the gray fox, the badger, the coyote, even the shrews, all play important parts. Some of the tribes credit their origin to certain animals; with others the wild creatures are descended from earlier people who have developed to an extraordinary degree speed of foot or skill in pursuit of certain game. In several sections, isolated from each other, occur tribes which are related in language to, and are supposed to be migrants from, the Athapascans, a great stock now forming the aboriginal inhabitants of a vast area in northern Canada. Others are offshoots of stocks which were masters of our great plains areas. For the most part, however, they appear to have been developed in the areas where they now live, or at least have been there for a very long time. Viewed from any standpoint a map of the tribal or linguistic distribution of the California Indian looks like a patchwork quilt. Some of these tribes are still fairly numerous in individuals; many are represented only by a few persons or perhaps a single individual, and several have become extinct within the past few years.

In many instances the local abundance of a certain food has determined the territory of a tribe. If it be a food both abundant and nutritious the tribe may have developed strength to hold this desirable territory. In others, a tribe weak in numbers may claim a section only by sufferance of their stronger neighbors. In nearly all cases, settlement by the whites has had an unfavorable or even a fatal influence on the tribal entity. But for the studies of a few earnest workers, and especially of one of America's foremost mammalogists, the story of many of California's aboriginal tribes could never have been given to the civilized world.

California's Observatories

(Continued from page 255)

now in its most unfavorable position for evening observation with the bowl resting nearly on the northern horizon.

Venus though still very low in the southwest at sunset will soon be a fine evening star. It now sets more than an hour after the sun and increases in brightness during the month. Jupiter is in Aries and in fine position for observation late in the evening. On October 28 it will come into opposition with the sun and will be visible from sunset to sunrise.

Saturn is still a fine evening star in Scorpio setting about three hours after the sun. It may be seen in the southwest immediately after sunset but is below the horizon at the time for which our map is given. Mars is in Gemini, rising about 9:30 in the evening the middle of October. It is now more brilliant than any of the stars with the exception of the two brightest, Canopus and Sirius. It will continue to increase rapidly in brightness during the month. Mercury will not be in a favorable position for observation at any time this month.

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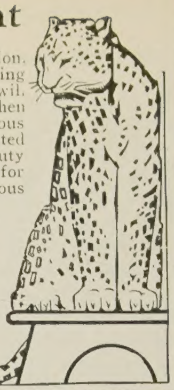

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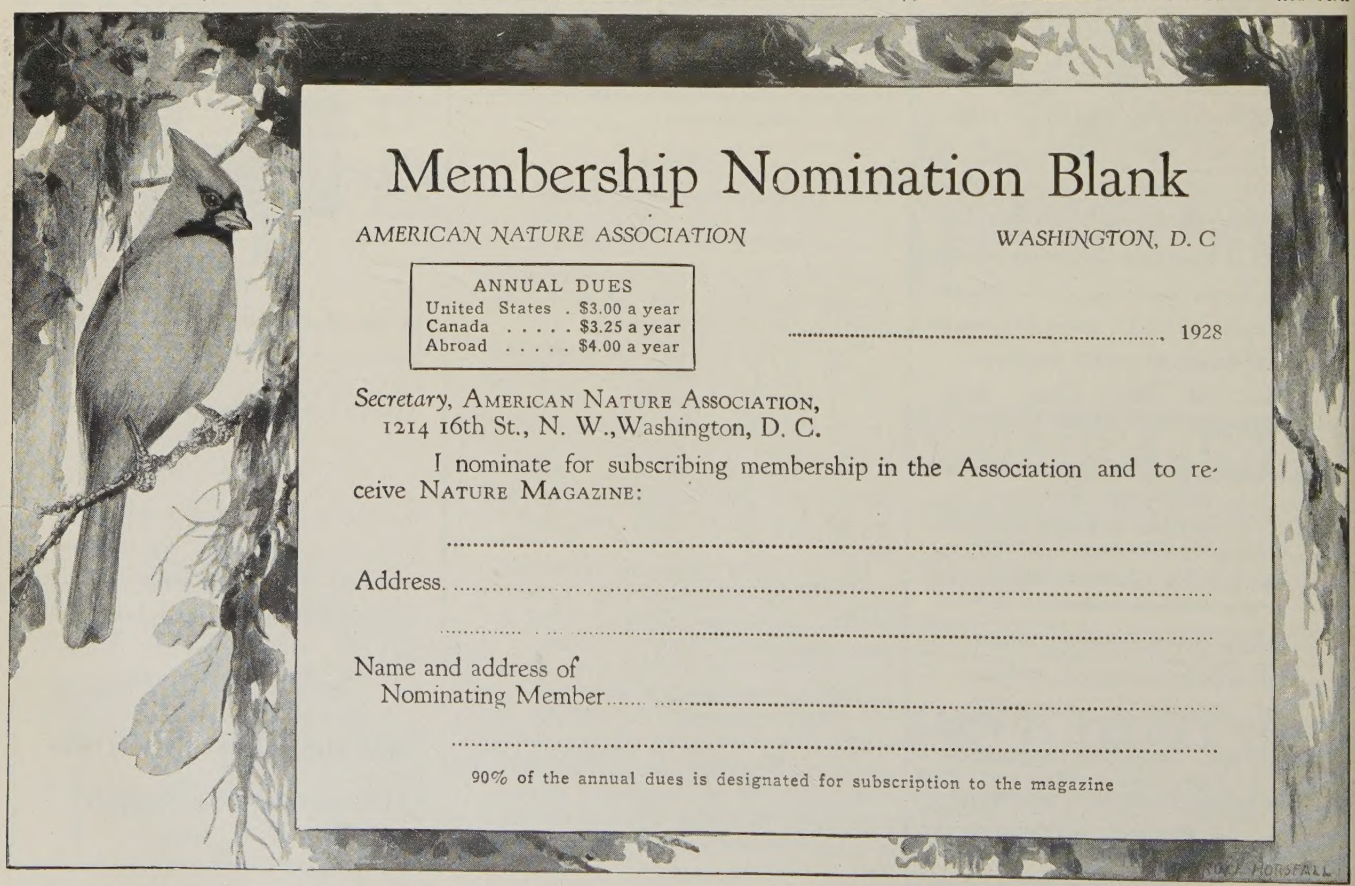

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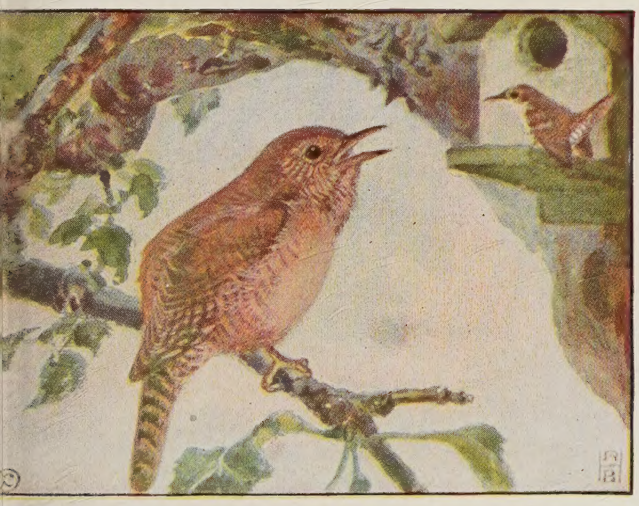

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